EXPANDED AGRIBUSINESS AND TRADE PROMOTION (USAID E-ATP)

In fulfillment of the following deliverable under task 1.3.1:

Transport Cost Assessments for Each Value Chain Along a Key Corridor, Updated Annually

Rice (FY 2010)

Contract/ Project No.: EDH-1-00-00005-11

Submitted to:

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EXPANDED AGRIBUSINESS AND TRADE PROMOTION

TRANSPORT AND LOGISTICS COSTS STUDY FOR RICE

JUNE 2011

June 2011

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LIST OF ABBREVIATIONS

ATP	Agribusiness and Trade Promotion Project
AU-NEPAD	African Union- New Partnership for Africa's Development
CAADP	Comprehensive Africa Agricultural Development Programme
CMTR	*Conseil malien des transporteurs routiers*
E-ATP	Expanded Agribusiness and Trade Promotion Project
FCFA	CFA Francs
IICEM	Integrated Initiatives for Economic Growth in Mali
IRTG	Improved Road Transport Governance
Km	Kilometers
OPAM	*Office des produits agricoles au Mali*
SPS	Sanitary and phyto sanitary
USAID	United States Agency for International Development
USD	US Dollars
WFP	World Food Program
WRS	Warehouse Receipts Scheme

ACKNOWLEDGEMENTS

This Transport and Logistics Assessment was carried out by a team from CARANA Corporation, subcontractor to Abt Associates on the USAID Expanded Agribusiness and Trade Promotion (E-ATP) Project:

- Laura Jane Busch MSc CA, Team Leader and Lead Field Researcher
- Daouda Moussa, Study Coordinator and Field Research Assistant
- Nathan Van Dusen, Research Task Manager

The field research for this assessment was shared between USAID E-ATP and the USAID *Integrated Initiatives for Economic Growth in Mali* (IICEM) Project, with part of the field research being completed by Salihou Guiro, Transport Adviser to IICEM.

This final report is authored principally by Laura Jane Busch. The author gratefully acknowledges the excellent research and logistical support of the following individuals:

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The author wishes to thank all of the rice value chain stakeholders and participants who were interviewed along the way, sharing privileged business information and frank assessments of costs, challenges and opportunities along the rice value chain in West Africa.

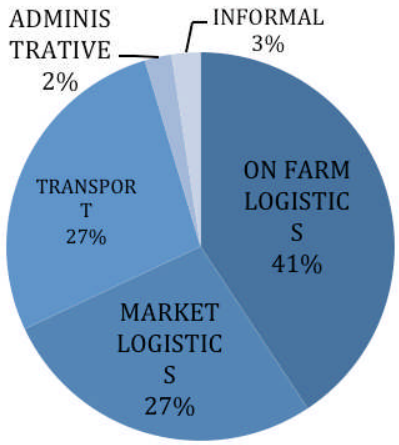
EXECUTIVE SUMMARY

This assessment finds that for rice along the corridors studied[1], approximately 25% of final market price is represented by transport and logistics costs. Moreover, approximately 11% of end market price is represented by "extra costs", or those costs considered as unjustified, inefficient or too expensive when compared with an optimized scenario.[2]

The following table highlights the main quantitative findings from this Transport and Logistics assessment.

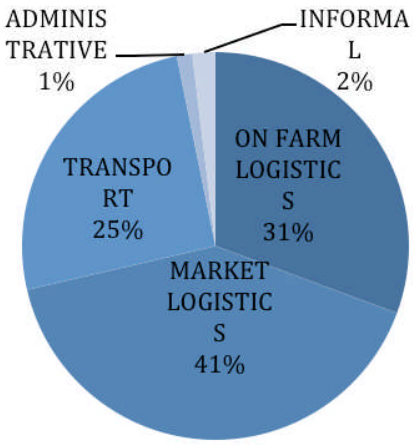
	KM	Total Transport and logistics costs FCFA	% Producer price	% Final sales price	Extra costs FCFA	% Extra costs over observed costs	% Extra costs of final sales price
Niono-Kayes	964	70.84	25.95%	24.57%	28.21	39.82%	9.40%
Bobo-Ouaga	385	87.26	29.54%	25.67%	44.22	50.68%	13.01%
Average	**675**	**79.05**	**27.74%**	**25.12%**	**36.21**	**45.25%**	**11.20%**

Total transport costs Niono-Kayes



Total transport costs Bobo-Ouaga

[1] Niono to Kayes and Bobo Dioulasso to Ouagadougou
[2] These percentages are much lower than for other cereals studied under ATP and E-ATP (maize, millet and sorghum), not because rice transport is less costly, but because rice is a higher value commodity.



As shown, the most important drivers of transport and logistics costs across both corridors were on-farm logistics costs, market logistics costs and transport costs. Of these, the most important drivers were losses during drying and shelling, losses during on-farm storage, and losses during storage in markets. High transport costs were also a major cost driver across both corridors, with transport costs from farm to consolidation point being the most important relative contributing cost in this category.

Transport and logistics costs are much higher (relative to distance) along the corridor Bobo-Ouaga in Burkina Faso, than the corridor Niono-Kayes. This is caused by several factors, including less developed market infrastructure, lack of good quality storage and higher transport prices.

This study also finds that cross-border flows of rice are limited, constrained by these high costs as well as quality issues. The research team observed flows of rice from Niono (a major rice production zone north of Segou) to Bamako (via Segou) and from Bamako to Kayes. No trade in rice originating in Mali was observed to Dakar, and no trade in rice was observed between Bobo Dioulasso and Segou. Traders stated that the price differential between the markets was insufficient to cover the high perceived transport costs and produce an adequate margin. Traders also cited periodic export bans and trade limitations as a further key reason they did not engage in cross border trade, and instead sourced their rice from local production zones. Furthermore, traders in Dakar stated that they preferred not to source rice from Mali as they perceived it to be poor quality, and that competitive imports from Asia were available.

In the context of global fears about rising food prices and food insecurity, this finding is tremendously important. Regional trade in West Africa is fundamental to food security and reducing vulnerability to external price shocks, as well as lifting millions out of poverty. But, faced with such high transport and logistics costs, traders are constrained in moving food staples like rice from surplus to deficit areas in the region. However, the potential exists to remove many of the inefficiencies and extra costs in the value chain system, improve economic incentives to trade, and increase regional price arbitrage.

Lastly, it is not recommended that cost data variables identified in this study be updated annually as specified in the terms of reference. The study team does not believe that this activity is a cost-effective method of monitoring any transport and logistics cost reductions due to project activities. The study team instead recommends targeted monitoring of specific transport and logistics costs subsequent to the implementation of recommendations.

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

FINDING	RECOMMENDATIONS
LACK OF ACCESS TO QUALITY ON-FARM LOGISTICS EQUIPMENT A key driver of cost, losses and reduced quality of rice is lack of access to good quality market logistics equipment, including de-shelling machines and weighing equipment. On farm logistics costs constitute up to 41% of total transport and logistics costs, of which up to 28% is considered to be "extra costs". Reducing these costs would allow farmers to capture greater value from their production.	**PILOT ACCESS TO FINANCE PROGRAM** Simple business plans based on cost savings could be put in place with the equipment asset used as collateral-purchased on an individual or collective basis. **PARTNERSHIP WITH EQUIPMENT SUPPLIER** Farm logistics supplier identified, USAID E-ATP could negotiate a supply partnership.
INADEQUATE WEIGHING EQUIPMENT IN MARKETS Lack of weighing equipment causes reliability concerns for buyers, this problem was observed to be particularly significant in Bobo Dioulasso and surrounding production areas, as well as in Niono. Up to 4.56% weight difference after purchase was observed during this study. This was a major concern for traders interviewed.	**ACCESS TO FINANCE** USAID E-ATP could pilot an access to finance program for certain market areas in the Bobo-Dioulasso region such as Bama, Banzon and Bobo Dioulasso itself**,** as well as in the Niono region for either individual purchase (by market traders), or collective purchase, perhaps by the market association. Financing could be secured on the assets. **USE OF STANDARD WEIGHTS** In conjunction with procurement of weighing equipment, the use of standard weights should also be encouraged. **PARTNERSHIP WITH EQUIPMENT SUPPLIER** Market logistics supplier identified, USAID E-ATP could negotiate a supply partnership. **PARTNERSHIP IN BRANDING QUALITY, ACCURATELY WEIGHED PRODUCTS** The research team has identified two potential partners interested in investing in the production of high quality, zero impurity, accurately weighed cereals for sale to mass markets. Expansion and scaling up of initiatives like this regionally would help to disseminate the message to the bottom of the value chain that quality and reliability is important and that buyers are willing to pay a premium.
AVOIDABLE STORAGE LOSSES Unnecessary storage losses are occurring in market areas. These	**TRAINING AND AWARENESS BUILDING ON BEST PRACTICE STORAGE TECHNIQUES** Training on these simple and easy to implement

storage losses account for up to 6.16% product loss along the logistics chain. Extra costs on market storage constitute up to 17% of total observed transport and logistics costs.	practices, as well as the potential benefits of employing them could reduce storage losses to an acceptable level. **PARTNERSHIPS WITH BUYERS** Successful example of a WFP's buyer-led initiative to ensure high quality storage of products in their supply chain to improve quality and reliability. USAID E-ATP should work with its network of larger buyers to assess their willingness to participate in similar initiatives. **WRS PILOT EXPANSION** Not only because high quality, purpose built warehousing is scarce, but also because it could improve access to credit to purchase equipment such as de-shelling machines, weighing scales and portable bag sewing machines as recommended in this study.
POST HARVEST HANDLING PRACTICES REDUCES QUALITY Quality issues are a significant problem for traders in the rice value chain, and an important constraint to expanded intra-regional trade. Impurities in rice were observed as approximately 2%. Traders cited they would be willing to pay a significant premium for better quality products. On-farm storage losses are also occurring, but are easily avoidable.	**TRAINING ON POST-HARVEST HANDLING** Simple measures such as drying grains out on a tarpaulin, protecting them from pests and ensuring no impurities are accidentally introduced would be beneficial alongside awareness building on the potential price premiums that could be obtained by implementing these practices. **CAPACITY BUILDING FOR PRODUCER COOPERATIVES TO ENCOURAGE FORMAL CONTRACTING** Formally introducing buyer-led demands on producers in this way is one solution to the quality and unreliability problem. **TRAINING ON BEST PRACTICE STORAGE TECHNIQUES** Storage best practices such as use of palettes to improve aeration, application of insecticides to reduce insects and controlling rodents were observed to reduce on-farm storage losses by a significant amount. Training on these simple and easy to implement practices, as well as the potential benefits of employing them, could reduce storage losses to an acceptable level.
LACK OF INFORMATION FOR BOTH TRADERS AND TRANSPORTERS ON EXPORTING Traders expressed difficulty in obtaining appropriate export documentation, lack of information on the existence of export bans and for those who did not already engage in cross border trade, a lack of knowledge about where to begin. Truckers were often confused or unaware of their obligations regarding appropriate documentation for their vehicles and their rights and obligations for various payments (official and non official) per journey.	**MARKET INFORMATION AND EXPORT PROMOTION CENTERS** USAID E-ATP could pilot the implantation of market information and export promotion centers that could provide this information to traders and truckers, as well as the required documentation. These centers could also provide training and information on best practice storage and handling techniques, as well as advice on contracting- such as providing pro-forma contracts. **EXPANSION OF INTRA-REGIONAL *BOURSE* TRADE FAIRS** Bourses were highlighted by several value chain stakeholders as an extremely effective means of building formal supply/customer relationships. USAID ATP already sponsors these events, but should consider expanding them within the region or increasing their frequency.

LOW PROFESSIONALISM AND HIGH INEFFICIENCY OF THE TRANSPORT SECTOR Lack of professionalism and informality in the transport sector is a key cause of inefficiency. Transport costs are the most important driver of costs in this analysis (up to 27% of total transport and logistics cost), of which up to 66% is considered "extra cost". Transport operatives do not generally respect proper labor rights for drivers and assistants, and lack of awareness of drivers of their rights with respect to control officials perpetuates the problem of road harassment.	**ADVOCACY AND AWARENESS BUILDING** USAID E-ATP should focus where possible on improving awareness of the issues through its information dissemination and advocacy activities (such as IRTG and Borderless), with particular focus on reaching out to drivers and those who are on the front lines of trucking services.
MANUAL HANDLING PRACTICES ARE PROBLEMATIC Manual handling of 100kg sacks is not only difficult and dangerous to the handlers, but is also a key cause of physical loss of product as the bags break open.	**BUSINESS PLAN FOR REDUCED SACK WEIGHT** Working with existing network of sack suppliers, USAID E-ATP could explore the feasibility of introducing a range of sacks with lower weight to the mainstream market, possibly by marketing through handlers themselves.
POOR QUALITY SACKS Poor quality, plastic, non-durable sacks are cheap to buy but lead to many extra costs in the value chain, including physical loss of product and the need to re-bag to replace worn out sacks.	**FEASIBILITY STUDY FOR JUTE SACK INTRODUCTION** USAID E-ATP could conduct a feasibility study on the introduction of jute sacks to the rice market, looking at market interest, ways to reduce consumer cost, and suitability for rice. **BUYER PARTNERSHIPS** Examples such as OPAM and WFP show that buyer-led initiatives for better quality sacks can be successful. USAID E-ATP should work with its network of buyers in the region to assess their willingness to implement buyer-led initiatives such as these.
POOR QUALITY BAG CLOSURE Traditional sewing methods are not only expensive, but also are a key cause of rips in sacks from which losses occur.	**PARTNERSHIP WITH AUTOMATIC BAG SEWING MACHINE SUPPLIERS** Suppliers identified, USAID E-ATP could seek to partner with these suppliers to encourage them to sell directly to market operators, perhaps by negotiating standard contracts. **ACCESS TO FINANCE** USAID E-ATP could pilot an access to finance programs for certain market areas in the region to encourage the purchase of these devices on a collective basis, or even by an entrepreneur who wishes to sell this service to market operators.
REPETITIVE CONTROL PROCEDURES Border and control procedures are repetitive and not streamlined. At	**ADVOCACY TO STREAMLINE PROCEDURES** Advocacy to streamline procedures, for better division of responsibility at borders (each agency checking separate

the border the various agencies such as Customs, Gendarme, and Police do not work together coherently, with the same checks and procedures being repeated many times over. **CERTAIN OFFICIAL COSTS ARE OF QUESTIONABLE VALUE** Some official costs for transporting cereals did not appear to add value, and also increase unnecessary bureaucracy.	things). Furthermore, along the road municipal taxes are extracted as a separate checkpoint, this could be collected at toll booths to remove this additional stop/slowdown for trucks. **ADVOCACY FOR REVIEW OF CERTAIN OFFICIAL COSTS SUCH AS THE CMTR "RISTOURNE"**

I. INTRODUCTION AND METHODOLOGY

I.I BACKGROUND

The Expanded Agribusiness and Trade Promotion Project (E-ATP) is a three year regional initiative funded by the United States Agency for International Development (USAID) launched in 2009. Building on the success of the USAID Agribusiness and Trade Promotion Project (ATP), USAID E-ATP has focused on three additional value chains: millet/sorghum, poultry and rice.

USAID E-ATP aims to increase the value and volume of intra-regional agricultural trade in its value chain development and associated activities along the major commercial corridors linking Benin, Burkina Faso, Cote D'Ivoire, Ghana, Mali, Nigeria, Senegal and Togo. USAID E-ATP is designed to contribute to achieving the 6 percent annual agricultural growth target set under the Comprehensive Africa Agriculture Development Program (CAADP) of the African Union's New Partnership for Africa's Development (AU-NEPAD).

Inefficiencies in West Africa's transport and logistics systems are a recognized constraint to trade within the region. Such inefficiencies increase supply chain costs for traders directly (high transport prices, informal payments) and indirectly (time to market, product spoilage), resulting in unnecessarily high consumer prices for imported commodities, lower than necessary profits for exporters and less regional trade. Furthermore, these barriers limit the free movement of agricultural products from production surplus areas to deficit areas and exacerbate food insecurity in this sub-region.

GENERALLY ACCEPTED FACTORS THAT INCREASE TRANSPORT AND LOGISTICS COSTS

Limited and unbalanced trade flows	Haphazard application of regional inter-state transport and transit treaties
Excessive road checkpoints	High vehicle operating costs
Bureaucratic procedures at border posts	Informal payments
Inadequate road and logistics infrastructure	Overloading of trucks
Lack of competition in trucking services	Strong market regulation

As part of Program Outcome 1, **"Significantly reduced incidence of physical and policy related barriers to moving agricultural and related commodities regionally, with a special focus on facilitating the trade in staple foods from surplus to deficit areas",** this rice Transport and Logistics assessment aims to understand how these factors interact with the overall operation of the rice value chain. Through these studies, USAID E-ATP and its stakeholders will gain a better understanding of how inefficiencies in the transport and logistics process relate to their overall costs (and competitiveness) and what can be done to address the most glaring inefficiencies to generate a list of highest priority interventions. This study will also

look for business opportunities to facilitate the creation of new public-private partnerships for investment in rice infrastructure and to improve the overall transport and logistics operations in West Africa.

The specific corridor of focus for the study is the Bobo Dioulasso-Segou-Bamako-Dakar corridor.

The rice Transport and Logistics Assessment will diagnose transportation and logistics related problems along the corridors, and propose recommendations to enhance the performance of the logistics chain. These recommendations will be validated by the stakeholders. The study will also recommend a package of best practices.[3]

I.I.I DEFINITIONS AND ASSUMPTIONS

1.1.1.1 ARTICULATION OF RELEVANT COSTS

Each of the cost categories and cost line items identified will be divided into *Observed Cost, Extra Cost* and *Optimized Cost,* to the extent possible with the data available*:*

- ***Observed Cost*** – costs as observed in the field research, based on averages and most common responses from field interviews;
- ***Extra Cost*** – a back-of-the-envelope estimation of the amount of the Observed Cost that is considered unnecessary, unjustified, or too expensive based on a variety of factors to be explained in each instance. For example, bribes and administrative charges without receipts or for which no service is rendered are considered extra costs. In some instances, extra costs are calculated based on market observations or reference to external sources. For example, Teravinthorn and Raballand (2008) provide benchmark estimates for per ton kilometer charges for transport costs. These benchmarks are used as a proxy for what a more competitive transport sector may be able to achieve in terms of lower prices.
- ***Optimized Cost*** – in this study, this is defined as the Observed Cost minus the Extra Cost.

1.1.1.2 COST CATEGORIES

The following table lists the main categories of costs and example costs observed in the rice value chain studied. These costs will be further discussed in Sections 3&4 along with the associated costs observed in the field research.

CATEGORIES AND TYPES OF COSTS OBSERVED

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
ON-FARM LOGISTICS All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to drying, shelling,	- On-farm loading charges - On-farm losses due to improper storage - On-farm shelling services - On-farm bagging services

[3] For a detailed explanation of the study's objectives and methodology, please see annex A

cleaning, bagging, and on-farm storage and handling costs.	
MARKET LOGISTICS All formal and informal charges for non-transport services rendered throughout the logistics process.	- Loading and unloading charges (not including on-farm loading) - Storage charges - Storage losses - Cost of bags - Re-bagging and sewing charges
TRANSPORT All formal and informal charges for transport services from farm to end market	- Transport fees/charges - Transport Agent Fee - Losses during transport
ADMINISTRATIVE CHARGES All formal and informal charges for trade facilitation services (customs, taxes, weigh stations, export documentation, and customs and forwarding agent fees)	- Customs fees - Weigh station fees - Conseil Malien des Transporteurs Routiers - Entrepots Malien au Senegal - Road tolls - Municipal taxes
INFORMAL PAYMENTS Explicit bribes paid	- Bribes paid at checkpoints - Bribes paid at borders

The categories capture the majority of the costs during the field research from the farm-gate to the market of final destination. When possible, copies of actual receipts were collected for formal fees.[4]

Both white rice and parboiled rice are traded in the region. Although no difference was observed in transport and logistics costs between the two products, this report focuses on white rice, as it was the most commonly observed variety traded by the value chain actors interviewed. All prices and costs are shown in FCFA. Monetized losses are based on cumulative loss multiplied by end market value. Please see annex A for more detail.

I.2 FLOWS OF RICE

The terms of reference for the rice Transport and Logistics Assessment call for an analysis of transport and logistics cost data along the corridor Bobo Dioulasso-Segou-Bamako-Dakar. During the field research, however, trade in rice was not observed along this full corridor.

The research team observed flows of rice from Niono (a major rice production zone north of Segou) to Bamako (via Segou) and from Bamako to Kayes. No trade in rice originating in Mali was observed to Dakar, and no trade in rice was observed between Bobo Dioulasso and Segou. Traders stated that the price differential between the markets was insufficient to cover the high perceived transport costs and produce an adequate margin. Traders also cited periodic export bans and trade limitations as a further key reason they did not engage in cross border trade, and instead sourced their rice from local production zones. Furthermore, traders in Dakar stated

[4] See pictures throughout report

that they preferred not to source rice from Mali as they perceived it to be poor quality, and that competitive imports from Asia were available.

The research team did, however, observe rice trade between Bobo Dioulasso (which has nearby rice production zones) and Ouagadougou. In order to show a more complete analysis of trade in rice in this region, the research team was able to gather sufficient data to analyze transport and logistics costs for rice on the eastbound corridor to Bobo Dioulasso and Ouagadougou, which are presented in this report along with analysis for rice westbound along the Niono-Segou-Kayes corridor.

2. SUMMARY OF TRANSPORT COST ANALYSES

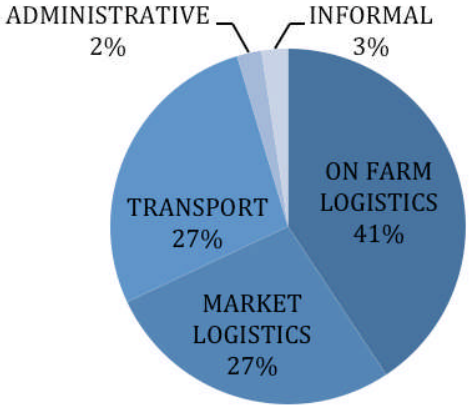
The following chapters described in detail all transport and logistics costs for rice traveling from Niono to Kayes and travelling from Bobo Dioulasso to Ouaga. These costs are then analyzed in terms of optimized costs and extra costs to highlight transport and logistics inefficiencies along these corridors. This section summarizes these key quantitative findings.

2.1 NIONO TO KAYES

TOTAL TRANSPORT AND LOGISTICS COSTS FOR RICE NIONO-KAYES

	FCFA/KG	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	28.83	**10.6%**	**10.0%**
MARKET LOGISTICS	19.36	**7.1%**	**6.7%**
TRANSPORT	19.37	**7.1%**	**6.7%**
ADMINISTRATIVE	1.59	**0.6%**	**0.6%**
INFORMAL	1.69	**0.6%**	**0.6%**
Total	**70.84**	**25.9%**	**24.6%**

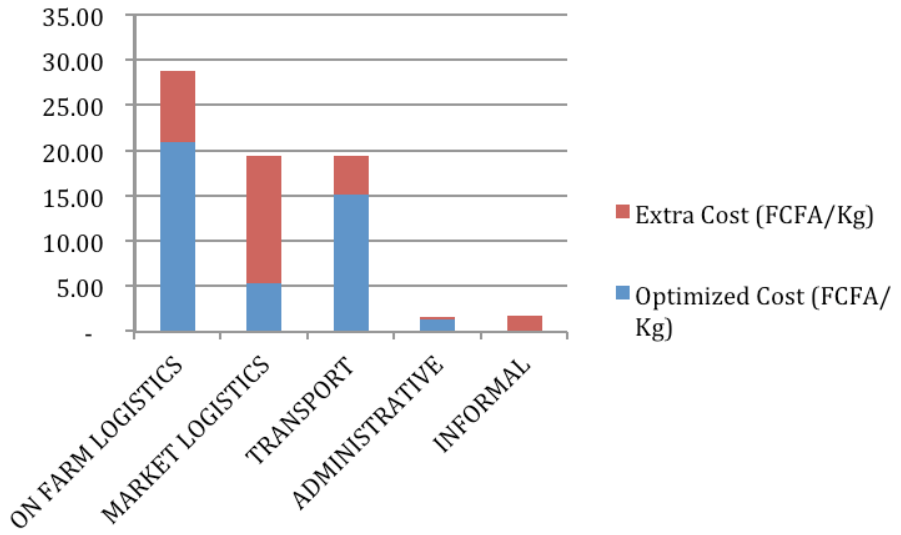
TOTAL TRANSPORT AND LOGISTICS COSTS FOR RICE NIONO-KAYES



EXTRA COSTS FOR RICE NIONO-KAYES

Summary	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
ON FARM LOGISTICS	28.83	20.89	7.94
MARKET LOGISTICS	19.36	5.36	14.00
TRANSPORT	19.37	15.11	4.26
ADMINISTRATIVE	1.59	1.28	0.31
INFORMAL	1.69	-	1.69
Total	**70.84**	**42.63**	**28.21**

EXTRA COSTS BY CATEGORY



PHYSICAL LOSSES

Description	Observed loss	Indicative weight (Kg)	Cumulative loss
Losses during drying and shelling	6.00%	0.94	6.00%
On farm storage losses	2.50%	0.92	8.35%
Niono Storage losses	0.49%	0.91	8.80%
Losses in transit Niono-Segou	0.06%	0.91	8.86%
Storage losses in Segou	0.31%	0.91	9.14%
Storage losses in Bamako	0.40%	0.90	9.50%
Storage losses in Kayes	0.40%	0.90	9.87%
Total			**9.87%**

For rice traveling from Niono to Kayes via Bamako, total transport and logistics costs are 70.84 FCFA/Kg, which represents 25.9% of producer price and 24.6% of end market price. Of these costs, 40% represent extra costs. Extra costs represent 9.4% of the end market price. Physical losses amount to 9.87% along the logistics chain.

In order of importance, the cost components of transport and logistics costs are:

- **On-farm logistics (41% of total observed costs, of which 28% is extra cost)**

  In this category, the key cost drivers are losses during drying and shelling and on-farm storage losses.

- **Transport (27% of total costs, of which 22% is extra cost)**

  In this category, the key cost driver is direct transport costs, i.e. price paid for transport services.

- **Market logistics (27% of total costs, of which 72% is extra cost)**

  In this category, the key cost drivers are separation of grains and re-bagging costs.

- **Informal costs (3% of total costs, of which 100% is extra cost)**

  In this category, the key cost driver is customs and gendarme bribes.

- **Administrative (2% of total costs, of which 20% is extra cost)**

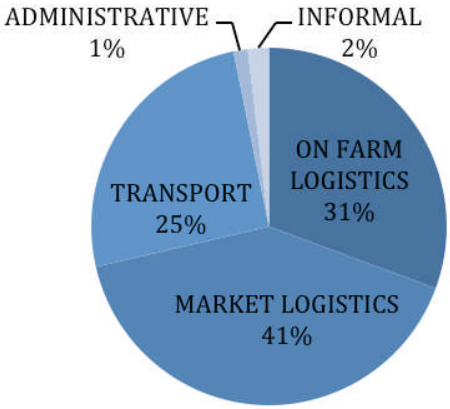
  In this category, the key cost driver is municipal taxes and CMTR payments.

2.2 BOBO DIOULASSO TO OUAGADOUGOU

TOTAL TRANSPORT AND LOGISTICS COSTS FOR RICE BOBO TO OUAGA

	FCFA/KG	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	26.74	**9.1%**	**7.9%**
MARKET LOGISTICS	35.53	**12.0%**	**10.4%**
TRANSPORT	22.20	**7.5%**	**6.5%**
ADMINISTRATIVE	1.13	**0.4%**	**0.3%**
INFORMAL	1.67	**0.6%**	**0.5%**
Total	**87.26**	**29.5%**	**25.7%**

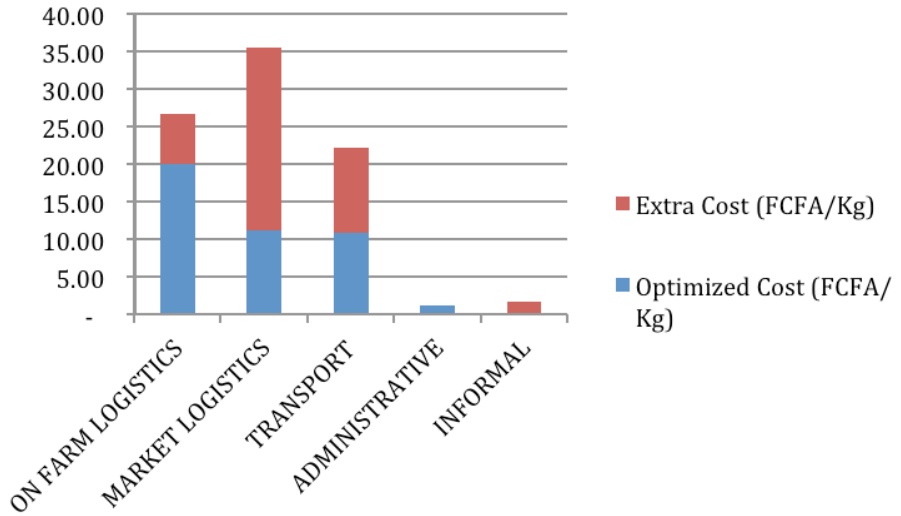
TOTAL TRANSPORT AND LOGISTICS COSTS FOR RICE BOBO TO OUAGA



EXTRA COSTS FOR RICE BOBO TO OUAGA

Summary	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
ON FARM LOGISTICS	26.74	19.94	6.80
MARKET LOGISTICS	35.53	11.10	24.43
TRANSPORT	22.20	10.87	11.32
ADMINISTRATIVE	1.13	1.13	0.00
INFORMAL	1.67	-	1.67
	87.26	**43.04**	**44.22**

EXTRA COSTS BY CATEGORY: RICE BOBO TO OUAGA



PHYSICAL LOSSES

Description	Observed loss	Indicative weight (Kg)	Cumulative loss
Losses during drying and shelling	6.00%	0.94	6.00%
Storage losses	1.75%	0.92	7.65%
Losses in transport to Bama	0.50%	0.92	8.11%
Storage losses in Bobo	3.75%	0.88	11.55%
Storage losses in Ouaga	2.41%	0.86	13.68%
Total			**13.68%**

For rice travelling from Bobo to Ouaga, total transport and logistics costs are 87.26 FCFA/Kg, **which represents 29.5% of producer price and 25.7% of end market price**. **Of these costs, 51% represent extra costs. Extra costs represent 13% of the end market price. Physical losses amount to 13.68% along the logistics chain.**

In order of importance, the cost components of transport and logistics costs are:

- **Market logistics (41% of total costs, of which 69% is extra cost)**

  In this category, the key cost drivers are cleaning to remove impurities and storage losses.

- **On farm logistics (31% of total observed costs, of which 25% is extra cost)**

  In this category, the key cost drivers are on farm losses during drying and shelling, and on farm storage losses.

- **Transport (25% of total costs, of which 51% is extra cost)**

  In this category, the key cost driver is direct transport costs, ie. price paid for transport services

- **Informal costs (2% of total costs, of which 100% is extra cost)**

  In this category, the key cost driver is bribes paid.

- **Administrative (1% of total costs, of which 0% is extra cost)**

  In this category, the key cost driver is municipal taxes.

3. TRANSPORT AND LOGISTICS COSTS ALONG THE NIONO-SEGOU-KAYES CORRIDOR

In this section, observed transport and logistics costs for rice along the Niono-Kayes corridor are detailed and described in detail. They are subsequently analyzed. As explained in section 1 above, the transport and logistics costs have been grouped into 5 categories for the purpose of analysis.

3.1 TRANSPORT COSTS OBSERVED

3.1.1 ON-FARM LOGISTICS

On-farm logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
ON FARM LOGISTICS All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to drying, shelling, cleaning, bagging, and on farm storage and handling costs.	- On-farm loading charges - On-farm losses due to improper storage - On-farm shelling services - On-farm bagging services

3.1.1.1 LOSSES AND COSTS DURING SHELLING AND DRYING

Post harvest, the paddy rice[5] is threshed to removed the grains from the plant, then typically is dried on a tarpaulin ("bache") in the sun (see right, Niono). The key cause of loss during drying is from animal and birds eating the grains.

After drying, the rice is de-shelled mechanically. Typically the machine is brought to the farm and the producer pays for its usage, but many larger scale producers own their machines[6]. See picture below left. During mechanical de-shelling, losses are caused by the poor quality of the machine destroying the grains.

[5] Rice still in its husk

[6] Of the rice producers we interviewed in Niono, all owned their machines. One farmer received his machine through a USAID project several years ago.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	LOSSES DURING DRYING AND SHELLING	6.00%	18.00	6.59%	6.00%	FARMER

3.1.1.2 ON-FARM STORAGE LOSSES

Of the producers interviewed in the Niono region during this study, those with adequate means stored for up to 6 months, and those who needed cash right away sold right after de-shelling. Significant losses occur during storage, mainly caused by insects.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	ON-FARM STORAGE LOSSES	2.50%	7.05	2.58%	2.35%	FARMER

3.1.1.3 ON-FARM BAGGING AND SEWING

The producers interviewed in the Niono region purchased plastic sacks and sewing materials, and hired assistance to manually fill and sew bags. 100 kg Sacks cost 240 FCFA each, filling and sewing costs 87.5 FCFA per bag.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	ON-FARM BAGGING AND SEWING	3.28	1.20%	1.09%	FARMER

3.1.1.4 ON-FARM LOADING CHARGES

Handling is included in the transport price (by truck) from farm to market. An assumed rate of 50 FCFA/100kg has been used here to illustrate the loading charges on farm. This price for handling is widely quoted and appears to be standard.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	ON-FARM LOADING		0.50[7]	0.18%	0.17%	FARMER

3.1.2 MARKET LOGISTICS

Market logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
MARKET LOGISTICS All formal and informal charges for non-transport services rendered throughout the logistics process.	- Loading and unloading charges (not including on-farm loading) - Storage charges - Losses in storage - Cost of bags - Re-bagging and sewing charges

3.1.2.1 HANDLING FEES

Throughout Mali and Burkina Faso, the price for loading or unloading a 100kg bag was consistently quoted as 50 FCFA. This process is entirely manual, with the handler lifting the sack on his head to load it onto the truck, and carrying it on his back to unload it (see right, Niono). Handling a 100kg sack manually is a very difficult and indelicate process, it is difficult for handlers to treat each sack with care so as not to cause rips and splits in the non-durable plastic material. For example, normally they are dropped or thrown to the ground rather than being placed. Traders cited manual handling practices as the key cause of sack breakage, which is the main source of in transit and storage losses[8] (discussed below).

Furthermore, the manual handling process is dangerous to the handlers. Handlers we spoke to experienced severe back and neck pain, and had witnessed serious accidents occurring. The average daily wage for a handler is just 1,500 FCFA, and they may lift up to a hundred 100 kg sacks per day.

[7] Handling is included in transport costs. An assumed rate of 50FCFA/100kg has been used based on handling charges at other stages of the value chain.

[8] Traders were unable to estimate the amount of loss attributable to handling practices. All losses due to handling are included within storage losses (market logistics) and transit losses (transport).

From arrival at the Niono to arrival in Kayes, a sack will be unloaded 4 times and loaded 3 times.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
NIONO	UNLOADING	0.50	0.18%	0.17%	TRADER
NIONO	LOADING	0.50	0.18%	0.17%	TRADER
SEGOU	UNLOADING	0.50	0.18%	0.17%	TRADER
SEGOU	LOADING	0.50	0.18%	0.17%	TRADER
BAMAKO	UNLOADING	0.50	0.18%	0.17%	TRADER
BAMAKO	LOADING	0.50	0.18%	0.17%	TRADER
BAMAKO	UNLOADING	0.50	0.18%	0.17%	TRADER
TOTAL		**3.50**	**1.26%**	**1.19**	

3.1.2.2 SEPARATION OF GRAINS

Whilst impurities in rice were not considered to be an important problem, quality of the grains, i.e. broken vs. intact grains were cited as a major concern for buyers in Mali. For example, one buyer in Segou stated that 60% of the rice grains he purchased were broken. This quality problem entails separating and re-bagging the rice. This rebagging cost is as a result of poor post-harvest handling practices and poor on-farm logistics equipment. Traders were unable to estimate the unit cost of this separation process, so an assumed rate of 5 FCFA/Kg has been used as a proxy, based on a similar activity for millet and sorghum performed in Sikasso.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SEGOU	SEPARATION OF GRAINS	5.00[9]	1.83%	1.67%	TRADER

3.1.2.3 STORAGE COSTS- NIONO

Traders in Niono utilized brick buildings, generally with corrugated aluminum or brick roofs to store sacks of rice while awaiting sale (see picture). Traders with more resources were able to store for several months to time the market and wait for the best price, but generally storage was only observed to be undertaken for 1 month. For very short term storage, sacks are often stored outdoors, as shown.

Storage prices vary in Niono, and there appear to be significant economies of scale to be made in renting large storage space. For example, a 300 sack warehouse rents for 0.67 FCFA/Kg, whereas

[9] Based on price for similar activity for millet in Sikasso

a 160 sack warehouse rents for 1.25 FCFA/Kg. An average value is shown below.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
NIONO	NIONO STORAGE	0.96	0.35%	0.32%	TRADER

3.1.2.4 LOSSES IN STORAGE - NIONO

The main cause of losses during storage cited in Niono is rodents. Very few of the traders we interviewed utilized palettes or insecticides, or took other measures to control rodents. Of those who utilized simple control measures, storage losses were reduced to a negligible level.

In one case we observed in Koutiala, the World Food Program (WFP) had specified particular storage methodology in its contract with a producer association. It had provided funding to construct a purpose-built warehouse, provided palettes and insecticide treatments, good quality sacks and training on proper stacking of sacks, for example, away from the warehouse walls. This warehouse was exemplary, with zero storage losses[10].

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
NIONO	NIONO STORAGE LOSSES	0.49%	1.35	0.49%	0.45%	TRADER

3.1.2.5 STORAGE IN SEGOU

As in Niono, the main storage method in Segou is in small brick storage units with corrugated aluminum roofs. Also, significant economies of scale appear to exist in Segou's storage, with prices varying from 0.63 FCFA/Kg/month for 40 T, to 0.05 FCFA/Kg/month for 1000 T. Traders did not generally report long term storage, stating working capital constraints. The average reported storage time in Segou was 1 month.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SEGOU	STORAGE IN SEGOU	0.27	0.10%	0.09%	TRADER

3.1.2.6 STORAGE LOSSES IN SEGOU

Storage losses in Segou are generally low, with traders utilizing palettes for aeration and other means to control pests. Also, the quality of the storage buildings appeared to be good.

[10] This example was for millet storage, but applicable to rice

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Segou	Storage losses in Segou	0.31%	0.85	0.31%	0.28%	Trader

3.1.2.7 STORAGE IN BAMAKO

As in Niono and Segou, the main storage method in Bamako is in small brick storage units with corrugated aluminum or brick roofs. Storage conditions were, however, observed to be more cramped and considerably dirtier. Traders did not generally report long-term storage, stating working capital constraints. The average reported storage time in Bamako was 1 month.

Location incurred	Item description	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Bamako	Bamako Storage	0.50	0.18%	0.17%	Trader

3.1.2.8 STORAGE LOSSES IN BAMAKO

Traders in Bamako reported no storage losses, however this finding was not deemed credible by the research team, as storage conditions appeared to be somewhat worse than those in Segou. As a proxy, an average of the storage losses in Niono and Segou has been used.

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Bamako	Storage losses in Bamako	0.40%[11]	1.09	0.40%	0.36%	Trader

3.1.2.9 STORAGE IN KAYES

The average cost of storage in Kayes is 0.53 FCFA/Kg/month

Location incurred	Item description	FCFA/Kg	% Farm gate price	% Final Sales Price	Borne by
Kayes	Storage in Kayes	0.53[12]	0.19%	0.18%	Trader

3.1.2.10 STORAGE LOSSES IN KAYES

No information was obtainable on storage losses in Kayes, a proxy based on assumed losses in Bamako has been used.

[11] This figure is a proxy, calculated using the average storage losses in Niono and Segou.
[12] This figure was based on assumed storage capacity of 1000 T

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Kayes	Storage losses in Kayes	0.40%[13]	1.09	0.40%	0.36%	Trader

3.1.2.11 SACKS

As a result of the need to separate high and low quality grains, as well as verify quality and replace worn out sacks, the rice is generally re-bagged in Segou before onward sale. 50 Kg sacks are purchased in the Segou marketplace for 180 FCFA each. In Segou, we only observed plastic sacks, which are non durable and can easily rip or break during handling, transit and storage. Exposure to the sun leads to degradation of the material (see left). Generally these sacks are only used once, as they are not durable enough to be re-used. Traders cited poor quality sacks as a key cause of losses[14], but are unable to source a better alternative for a reasonable price.

Larger buyers such as OPAM and WFP specify particular types of bags to be used. For example, OPAM[15] specifies the use of jute sacks (see right), which are much more durable than plastic sacks and so can be used for long term storage (more than 1 year). Unfortunately, jute sacks are very expensive, prices from 500-800 FCFA per sack were cited, so this is too expensive for most traders without contracts with larger buyers.

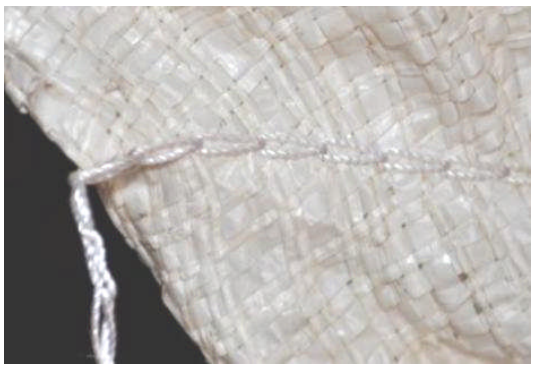
Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Segou	Sacks in Segou		3.60	1.32%	1.20%	Trader

[13] This figure is a proxy, based on assumed storage losses in Bamako.
[14] Traders were unable to estimate the rate of losses attributable to poor quality sacks. All physical losses due to poor quality sacks are included within storage (market logistics) and in transit losses (transport).
[15] In the case of millet, but applicable to rice

3.1.2.12 RE-BAGGING AND SEWING CHARGES - SEGOU

Re-bagging and sewing services are provided in the market. Traditional sewing methodology leads to rips in the sack (see below), and is a key cause of holes from which losses occur.[16]

The research team observed two instances where wholesalers used portable automatic sewing machines to close bags after re-bagging. This process took just a few seconds and produced an even seam with no ripping. The wholesalers stated that this machine could be bought new for a cost of 150,000 FCFA, and generally lasted for 2-3 years. Please see the pictures below.



LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SEGOU	FILLING AND SEWING IN SEGOU		0.63	0.23%	0.21%	TRADER

3.1.3 TRANSPORT

Transport costs observed include:

[16] Traders were unable to estimate the rate of losses attributable to traditional sewing methods. All physical losses due to poor quality sacks are included within storage (market logistics) and in transit losses (transport).

Cost Category	Examples of costs observed
Transport All formal and informal charges for transport services from farm to end market.	- Transport fees/charges - Transport Agent Fee - Losses during transport

3.1.3.1 TRANSPORT FEES AND CHARGES

Transport fees and charges are direct fees paid to transport service providers. This price does not generally include handling, but it does include several official and informal costs paid along the road to control officials, including tolls, weigh stations police and gendarme bribes. This is discussed in the following section. Transport prices vary depending on the demand for transport, which is highly dependent on crop calendar (especially for cotton).

It should also be noted that the observed professionalism of transporters was low, with many deliberately running trucks illegally, and having little respect for the labor rights of the drivers they employed. For example, it is the law that an employer must pay into social security ("Caisse de Securite") for employees, and this is supposedly checked by border police agents as trucks pass through checkpoints. No truck owners interviewed provided this for their drivers, and many drivers stated they were rarely even paid their salary on time.

Location incurred	Item description	Km	FCFA /Kg	FCFA /Kg/Km	% Farm gate price	% Final Sales Price	Borne by
Farm-Niono	Farm-Niono transport	3	2.50	0.833	0.92%	0.83%	Farmer
Niono-Segou	Niono-Segou Transport[17]	108	5.34	0.049	1.96%	1.78%	Trader
Segou-Bamako	Segou-Bamako transport	238	6.35	0.027	2.33%	2.12%	Trader
Bamako-Kayes	Bamako-Kayes transport	615	5.00[18]	0.008	1.83%	1.67%	Trader

3.1.3.2 LOSSES IN TRANSIT

Losses in transit were reported between Niono and Segou, and the main causes were cited as poor handling practices and poor quality sacks. After the initial journey from Niono-Segou, negligible losses in transport were reported along this rice trade corridor.

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Niono-Segou	Losses in transit Niono-Segou	0.06%	0.17	0.06%	0.06%	Trader

[17] In a 10 T truck
[18] This is an implied price, estimated based on observed prices for Bamako-Dakar transport.

3.1.4 ADMINISTRATIVE

Administrative costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
ADMINISTRATIVE CHARGES All formal and informal charges for trade facilitation services (customs, taxes, weigh stations, export documentation, and customs and forwarding agent fees).	- Customs fees - Weigh station fees - Conseil Malien des Transporteurs Routiers - Entrepots Malien au Senegal - Road tolls - Municipal taxes

Please note that administrative procedures/obligations for trading/transporting rice that either did not attract a monetary cost, or were not directly related to the movement of rice are not included.

It should also be noted that traders cited difficulty in obtaining the appropriate trade/export documentation from their local chamber of commerce/municipal authority and that often they just did not bother, preferring to pay the associated bribes in transit.

3.1.4.1 MUNICIPAL TAXES

In Mali, municipal taxes ("la Mairie") are levied at several towns (below) along the route from Niono to Kayes. This cost is paid by the transporter.

- Niono
- Markala
- Segou
- Fana
- Bamako
- Kati
- Kolokani
- Kayes

A receipt is given for these costs. Each payment is 500 to 1000 FCFA per 40T truck, and it is supposed to cover the costs to the municipality of the truck transiting the town. The municipal tax is a separate control post, at either the entry or exit of the municipality, and in addition to the cost, causes an additional delay to the truck. These costs are paid by the transporter, and included within the price paid for transport services by the trader.

3.1.4.2 ROAD TOLLS (PEAGE)

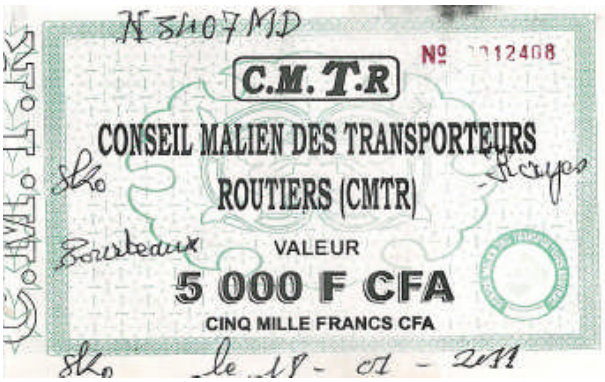
Toll booths are located along the route at several municipalities in Mali. Tolls are levied depending on truck size and chassis configuration. The normal payment for a 40 T truck is 2,500 at each toll booth.

The road tolls are paid by the transporter, and included within the price paid for transport services by the trader.

3.1.4.3 CMTR (CONSEIL MALIEN DES TRANSPORTEURS ROUTIERS)

The CMTR was founded in 2004 and became operational in 2009. It was set up to encompass all previous professional transporting bodies and create a unified voice for the Malian transport sector. The CMTR's main role is as interlocutor between the transport sector and the government, and its aims include promoting free circulation of goods and professionalizing the transport sector. The CMTR provides the "lettre de voiture" or transport waybill, for a fee of 1,000 FCFA and also charges a fee of 5,000 FCFA per international journey (2,500 per domestic journey). Foreign trucks entering and ending their journey in Mali, must pay 10,000 FCFA. This fee is known as "la Ristourne" (see picture).

All drivers and transporters interviewed saw no value in the CMTR ristourne payments, and did not feel a service was provided in return for the fee. CMTR representatives interviewed, including the president of the CMTR in Bamako, vehemently defended the work of the CMTR in representing the interests of the transport sector. It is widely felt, however, that the CMTR is not effective and adds little value considering the amount of money it charges.



The CMTR is paid by the transporter, and included within the price paid for transport services by the trader.

The journey from Niono to Kayes entails two major truck journeys (from Segou to Bamako, and from Bamako to Kayes) therefore the CMTR is paid twice.

3.1.4.4 SYNDICAT DES CHAUFFEURS

Various *"syndicats"*, which are local transport unions charge a fee of 1000 FCFA per journey. Drivers felt that this was a reasonable fee and the unions provided a useful service to them if they needed assistance or arbitration.

This fee is paid by the transporter, and included within the price paid for transport services by the trader. See receipt in picture.

3.1.4.5 UNLOADING/PARKING IN BAMAKO

Transporters reported paying 1,000 FCFA per truck to park and unload their vehicles on arrival in Bamako. This included in the price paid for transport services by the trader.

ADMINISTRATIVE CHARGES

ITEM DESCRIPTION	FCFA	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
MUNICIPAL TAX	5000	0.35	0.13%	0.12%	TRANSPORTER
ROAD TOLLS	9500	0.58	0.21%	0.19%	TRANSPORTER
CMTR	5000	0.31	0.11%	0.10%	TRANSPORTER
LETTRE DE VOITURE	2000	0.13	0.05%	0.04%	TRANSPORTER
SYNDICAT DES VOITURES	2000	0.13	0.05%	0.04%	TRANSPORTER
UNLOADING/PARKING	1000	0.10	0.04%	0.03%	TRANSPORTER
	24500	**1.59**	**0.58%**	**0.53%**	

3.1.5 INFORMAL

Informal costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
INFORMAL PAYMENTS Explicit bribes paid	- Bribes paid at checkpoints - Bribes paid at borders

Since trade in rice was not observed across international borders during the field research, no border bribes are included here.

3.1.5.1 BRIBES PAID AT CHECKPOINTS

Road harassment and corruption are widely acknowledged as a problem. Bribes are extracted by customs, police, gendarme and SPS services at the borders along the route. The amount of checkpoints is extremely high, contrary to UEMOA legislation, and bribe extraction seems standard procedure. The research team spoke with multiple drivers who described the bribe amount at each checkpoint along the road, and their reports corroborated each other accurately. Drivers reported bribes to be worse at night.

As the ATP IRTG reports deal with road harassment in detail, only headline figures are reported here.

This report assumes that customs bribes and SPS bribes are paid by the trader, and police/gendarme bribes are paid by the transporter. In reality, who pays the bribes depends on the situation, but this division appears to be the most common.

INFORMAL COSTS

ITEM DESCRIPTION	FCFA	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
CUSTOMS BRIBE	12000	0.60	0.22%	0.20%	TRADER
POLICE BRIBE	5000	0.39	0.14%	0.13%	TRADER
GENDARME BRIBE	9250	0.61	0.22%	0.20%	TRANSPORTER

SPS BRIBE	1000	0.10	0.04%	0.03%	TRANSPORTER
TOTAL	**27250**	**1.69**	**0.62%**	**0.56%**	

3.1.6 ITEMS NOT INCLUDED IN TRANSPORT COST ANALYSIS

3.1.6.1 WEIGHT DIFFERENCE

Traders in Segou complained that as a result of poor rural weighing equipment, rice sacks that arrived in Segou were often of lower weight than what they had paid for. The magnitude of this weight difference was reported to be approximately **1.5%**.

3.2 TRANSPORT COSTS ANALYZED

3.2.1 OVERALL COST DRIVERS

The transport and logistics costs observed along the Niono-Kayes corridor have been described in detail above; the following table summarizes these costs.

DETAILED TRANSPORT AND LOGISTICS COSTS PER KG OF RICE TRAVELING FROM SIKASSO TO DAKAR

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final sales price	Borne by
Farm	Losses during drying and shelling	6.00%	18.00	6.59%	6.00%	Farmer
Farm	On farm storage losses	2.50%	7.05	2.58%	2.35%	Farmer
Farm	On farm bagging and sewing		3.28	1.20%	1.09%	Farmer
Farm	On farm loading		0.50	0.18%	0.17%	Farmer
Farm-Niono	Farm-Niono transport		2.50	0.92%	0.83%	Farmer
Niono	Niono Farmer Sales Price		273.00			
Niono	Unloading		0.50	0.18%	0.17%	Trader
Niono	Niono Storage		0.96	0.35%	0.32%	Trader
Niono	Niono Storage losses	0.49%	1.35	0.49%	0.45%	Trader
Niono	Niono Wholesale Price		280.00			
Niono-Segou	Niono-Segou Transport		5.34	1.96%	1.78%	Trader
Niono	Loading		0.50	0.18%	0.17%	Trader
Niono-Segou	Losses in transit Niono-Segou	0.06%	0.17	0.06%	0.06%	Trader
Segou	Unloading		0.50	0.18%	0.17%	Trader
Segou	Separation of grains		5.00	1.83%	1.67%	Trader
Segou	Sacks in Segou		3.60	1.32%	1.20%	Trader
Segou	Filling and sewing in Segou		0.63	0.23%	0.21%	Trader
Segou	Storage in Segou		0.27	0.10%	0.09%	Trader
Segou	Storage losses in Segou	0.31%	0.85	0.31%	0.28%	Trader
Segou-Bamako	Segou-Bamako transport		6.35	2.33%	2.12%	Trader
Segou	Loading		0.50	0.18%	0.17%	Trader
Bamako	Unloading		0.50	0.18%	0.17%	Trader
Niono-Bamako	Informal costs on road		0.50	0.18%	0.17%	Trader

Niono-Bamako	Informal costs on road		0.85	0.31%	0.28%	Transporter
Bamako	Bamako Sales Price		288.33			
Bamako	Bamako Storage		0.50	0.18%	0.17%	Trader
Bamako	Storage losses in Bamako	0.40%	1.09	0.40%	0.36%	Trader
Bamako-Kayes	Bamako-Kayes transport		5.00	1.83%	1.67%	Trader
Bamako	Loading		0.50	0.18%	0.17%	Trader
Bamako	Unloading		0.50	0.18%	0.17%	Trader
Niono-Kayes	Official costs on road		1.59	0.58%	0.53%	Transporter
Bamako-Kayes	Informal costs on road		0.20	0.07%	0.07%	Trader
Bamako-Kayes	Informal costs on road		0.14	0.05%	0.05%	Transporter
Kayes	Storage in Kayes		0.53	0.19%	0.18%	Trader
Kayes	Storage losses in Kayes	0.40%	1.09	0.40%	0.36%	Trader
Kayes	Kayes Sales Price		300.00			

Source: Field interviews and calculations

The following table presents these costs summarized by cost type:

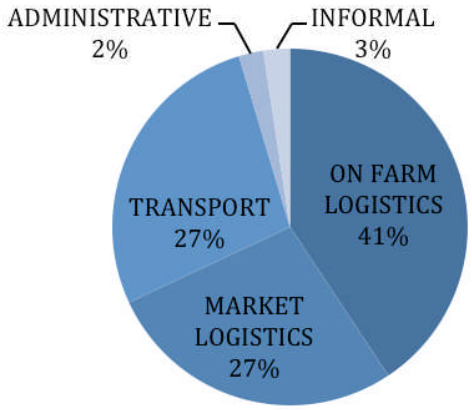
SUMMARY OF TRANSPORT AND LOGISTICS COST PER KG OF RICE TRAVELING BETWEEN NIONO AND KAYES

	FCFA/KG	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	28.83	**10.6%**	**10.0%**
MARKET LOGISTICS	19.36	**7.1%**	**6.7%**
TRANSPORT	19.37	**7.1%**	**6.7%**
ADMINISTRATIVE	1.59	**0.6%**	**0.6%**
INFORMAL	1.69	**0.6%**	**0.6%**
Total	**70.84**	**25.9%**	**24.6%**

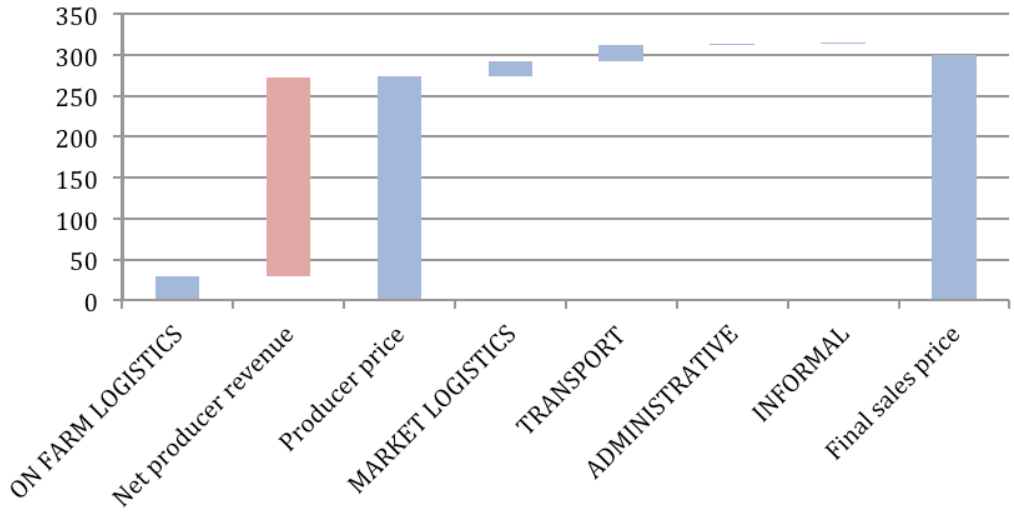
The total transport and logistics costs account for 70.84 FCFA/Kg of rice traveling from Sikasso to Dakar, which equates to 25.9% of farm gate price and 24.6% of final end market price.

As can be seen from the pie chart below, the most important drivers of transport and logistics costs are on-farm logistics costs, which represent 41% of the total costs, and market logistics and transport costs, which each represent 27% of the total costs.

COMPONENTS OF TOTAL TRANSPORT AND LOGISTICS COSTS



STEP CHART OF TRANSPORT AND LOGISTICS COSTS BY CATEGORY



Please note that net producer revenue does not take into account any other costs of production.

3.2.1.1 PHYSICAL LOSSES

Description	Observed loss	Indicative weight (Kg)	Cumulative loss
Losses during drying and shelling	6.00%	0.94	6.00%
On farm storage losses	2.50%	0.92	8.35%
Niono Storage losses	0.49%	0.91	8.80%
Losses in transit Niono-Segou	0.06%	0.91	8.86%
Storage losses in Segou	0.31%	0.91	9.14%
Storage losses in Bamako	0.40%	0.90	9.50%
Storage losses in Kayes	0.40%	0.90	9.87%
Total			**9.87%**

Total physical losses along the logistics chain are 9.87%, mainly driven by on-farm losses.

3.2.2 EXTRA COST ANALYSIS

This section analyzes each observed cost in terms of optimized and extra costs

3.2.2.1 ON FARM LOGISTICS

The following table summarizes the extra costs identified in the on farm logistics category.

COST ANALYSIS FOR THE ON FARM LOGISTICS CATEGORY

ON FARM LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Losses during drying and shelling	6.00%	18.00	12.00	6.00
On farm storage losses	2.50%	7.05	5.64	1.41
On farm bagging and sewing		3.28	2.75	0.53
On farm loading		0.50	0.50	
Total		**28.83**	**20.89**	**7.94**

Losses during drying and shelling are observed to be 6.00%. In discussions with value chain leaders on the IICEM project, the acheivable level of losses during this post harvest handling is 4%, which is monetized to a cost of 12.00 FCFA/Kg.

On-farm storage losses are observed to be 2.50%. In discussions with value chain leaders on the IICEM project, the acheivable level of losses during this on farm storage is 2%, which is monetized to an optimized cost of 5.64 FCFA/Kg.

On-farm bagging and sewing costs are observed to be 3.28 FCFA/Kg, which includes the cost of an empty sack (240 FCFA) and 0.88 FCFA/kg in filling and sewing costs. As noted above, the research team observed instances of use of automatic handheld sewing machines, which produced a high quality seam in no more than a few seconds. These machines could be purchased for 150,000 FCFA and last approximately 2 years. A prudent estimate of 150 bags sewn per week results in a per Kg cost of 0.10 FCFA (See table)

ESTIMATED PER KG COST OF HANDHELD SEWING MACHINE

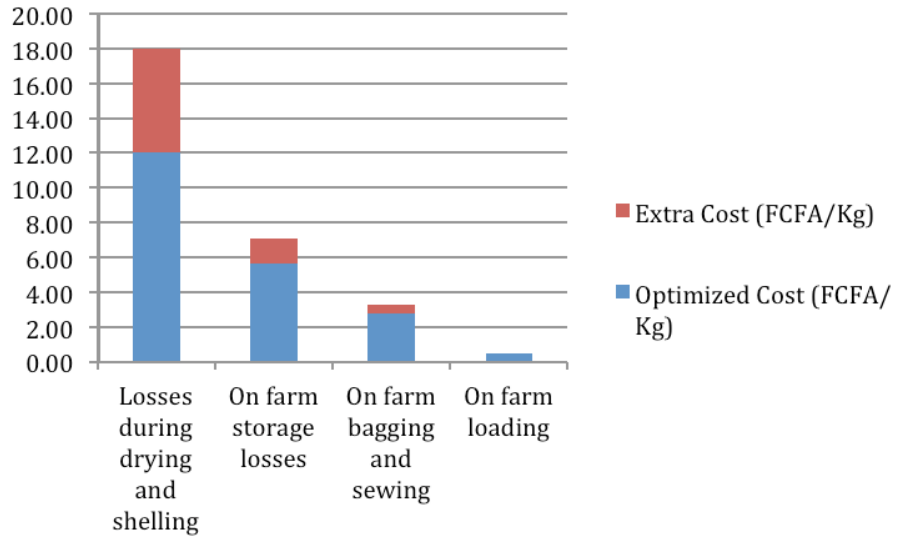
Per Kg cost of handheld sewing machine		Unit	Source
Cost of sewing machine	150000.00	FCFA	Field interviews
Years of use	2.00	Years	Field interviews
Amortized cost per week	1442.31	FCFA/Week	Calculation
Uses per week	150	#	Consultant estimate
Cost per 100kg bag	9.62	FCFA/100Kg	Calculation
Cost per kg	0.10	FCFA/Kg	Calculation

Based on the cost of loading a 100kg sack, 0.5 FCFA/kg, it can be assumed that filling a sack (a much less strenuous and less skilled job) would be no more than 0.25 FCFA/kg.

In total, the assumed optimized cost for filling and sewing a bag on farm should be 0.25+0.1= 0.35 FCFA/kg, plus the bag cost of 2.5 FCFA/Kg.

On farm loading charges no basis for estimating extra costs for this item.

EXTRA COSTS IN THE ON FARM LOGISTICS CATEGORY



Extra costs amount to 7.94 FCFA/Kg, out of 28.83 FCFA/Kg of total on farm logistics costs. In other words, 28% of on farm logistics costs are considered to be extra costs.

3.2.2.2 MARKET LOGISTICS

The following table summarizes the extra costs identified in the market logistics category.

COST ANALYSIS FOR THE MARKET LOGISTICS CATEGORY

MARKET LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Niono Storage		0.96	0.77	0.19
Niono Storage losses	0.49%	1.35	0.00	1.35
Separation of grains		5.00	0.00	5.00
Handling		3.50	3.50	
Sacks in Segou		3.60	0.00	3.60
Filling and sewing in Segou		0.63	0.00	0.63
Storage in Segou		0.27	0.27	0 .00
Storage losses in Segou	0.31%	0.85	0.00	0.85
Bamako Storage		0.50	0.40	0.10
Storage losses in Bamako	0.40%	1.09	0.00	1.09
Storage in Kayes		0.53	0.42	0.11
Storage losses in Kayes	0.40%	1.09	0.00	1.09
Total		**19.36**	**5.36**	**14.00**

Storage in Niono Prices quoted in Niono are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. Modern large-scale warehousing facilities were not readily available in the market. A discount of 20% has been assumed as a proxy for potential reduced costs if a higher volume of product is stored and a commercial storage market is developed.[19]

Losses in storage in Niono The research team observed instances of use of simple storage techniques such as aeration palettes and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.

Separation of grains to achieve the best price premium and demands of buyers, all grains should be intact and of high quality, and there subsequently should be no need for the traders to separate them out before sale.

Handling no basis for estimating extra costs for this item.

Purchase of sack/filling and sewing In an optimized scenario there should be no need to re-bag sacks again after leaving the farm. Ideally, one bag would be used only once and throughout entire export operation. Therefore these cost are considered as extra costs.

Storage in Segou Prices quoted in Segou are for storage facilities that are well built and experience low storage losses. Therefore there are no extra costs in this category.

[19] See ATP Maize Transport and Logistics assessment, Dave Schacht.

Losses in storage in Segou The research team observed instances of use of simple storage techniques such as aeration palettes and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.

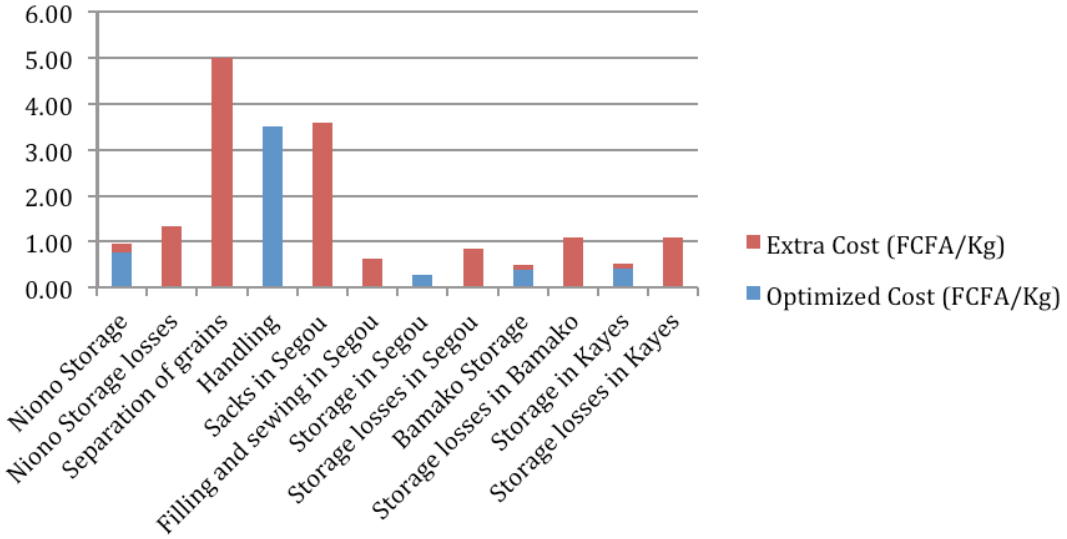
Storage in Bamako Prices quoted in Bamako are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. Modern large-scale warehousing facilities were not readily available in the market. A discount of 20% has been assumed as a proxy for potential reduced costs if a higher volume of product is stored and a commercial storage market is developed.[20]

Losses in storage in Bamako The research team observed instances of use of simple storage techniques such as aeration palettes and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.

Storage in Kayes Prices quoted in Kayes are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. Modern large-scale warehousing facilities were not readily available in the market. A discount of 20% has been assumed as a proxy for potential reduced costs if a higher volume of product is stored and a commercial storage market is developed.[21]

Losses in storage in Kayes The research team observed instances of use of simple storage techniques such as aeration palettes and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.

EXTRA COSTS IN THE MARKET LOGISTICS CATEGORY



[20] See ATP Maize Transport and Logistics assessment, Dave Schacht.
[21] See ATP Maize Transport and Logistics assessment, Dave Schacht.

Extra costs amount to 14.00 FCFA/Kg, out of 19.36 FCFA/Kg of total market logistics costs. In other words, 72% of market logistics costs are considered to be extra costs.

3.2.2.3 TRANSPORT

The following table summarizes the extra costs identified in the transport category.

COST ANALYSIS FOR THE TRANSPORT CATEGORY

TRANSPORT	Oberved %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Farm-Niono transport		2.50	0.08	2.42
Niono-Segou Transport		5.34	3.67	1.67
Losses in transit Niono-Segou	0.06%	0.17	0.00	0.17
Segou-Bamako transport		6.35	6.35	0.00
Bamako-Kayes transport		5.00	5.00	0.00
Total		**19.37**	**15.11**	**4.26**

Farm to consolidation transport cost Observed costs in this category are 2.50 FCFA/Kg, for an assumed 3km journey from farm to Niono. This transit is undertaken in 5 to 10 T trucks. As can be seen from the table below, the cost per Kg/Km for this segment are extremely high in comparison with subsequent segments.

TRANSPORT COSTS PER KG/KM

Segment	KM	FCFA/Kg	FCFA/Kg/KM
Farm-Niono transport	3	2.50	0.833
Niono-Segou Transport	108	5.34	0.049
Segou-Bamako transport	238	6.35	0.027
Bamako-Kayes transport	615	5.00	0.008

This could be caused by several plausible reasons including short distance and small shipments leading to low economies of scale, relative bargaining power of farmers, and low supply of trucks. While many transporters and farmers cited poor quality of roads as a major determinant of price over these segments, price and road quality data did not support this posit[22].

Taking the transport cost per Kg/Km from Segou to Bamako of 0.027 as a proxy for a more efficient transport market, the implied optimized cost for the farm to consolidation segment is 0.08 FCFA/Kg.

[22] Through the course of the study, data on transport prices between various localities were collected and the respondents also were questioned on the average road quality along these routes. No correlation was found between poor quality of roads and high transport price, when viewed on a per FCFA/Km basis.

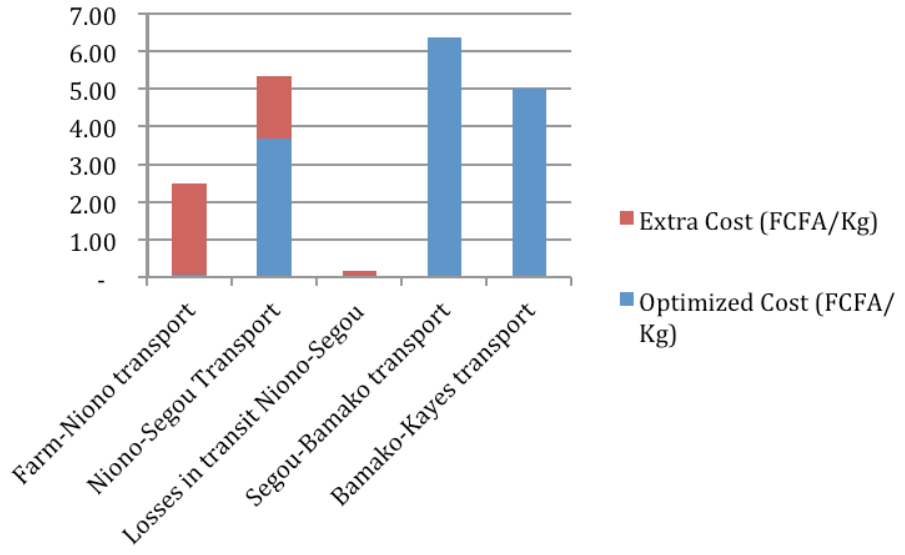
Niono to Segou transport costs The observed transport cost for this 108km segment is 0.049 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)[23] suggest that average transport prices for long distances (1000+ km) in West Africa per kg/km are 0.034 FCFA.[24] Transport costs for this segment are likely elevated for the same reasons as above, market inefficiency and lack of economies of scale. Taking this transport cost per Kg/Km over long distances in West Africa as a proxy for a more efficient transport market for this 108 Km distance, the implied optimized cost for the farm to consolidation segment is 3.67 FCFA/Kg.

Segou to Bamako transport costs The observed transport cost for this segment is 0.027 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)[25] suggest that this price is actually quite reasonable in comparison with other markets. For example, according to their study, transport prices in Western Europe are approximately 0.024 FCFA/Kg/Km[26], and in the US are 0.019 FCFA/Kg/Km[27]. Therefore, we find that there are no extra costs in this category.

Bamako to Kayes transport costs The observed transport cost for this segment is 0.008 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)[28] suggest that this is price is actually low compared with other markets, see above re: Segou to Bamako. Therefore, we find that there are no extra costs in this category.

Losses in transport Losses in transport are as a result of poor handling, poor packaging and poor trucks. All losses in transport are considered and unnecessary and therefore extra costs.

EXTRA COSTS IN THE ADMINISTRATIVE CATEGORY



[23] Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008
[24] In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/$.
[25] Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008
[26] In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/$.
[27] In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/$.
[28] Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008

Extra costs amount to 4.26 FCFA/Kg, out of 19.37 FCFA/Kg of total transport costs. In other words, 22% of transport costs are considered to be extra costs.

3.2.2.4 ADMINISTRATIVE

The following table summarizes the extra costs identified in the administrative category.

COST ANALYSIS FOR THE ADMINISTRATIVE CATEGORY

ADMINISTRATIVE	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Municipal tax	0.35	0.35	0.00
Unloading/parking	0.10	0.10	0.00
CMTR	0.31	0.00	0.31
Lettre de Voiture	0.13	0.13	0.00
Syndicat des Voitures	0.13	0.13	
Peage	0.58	0.58	
Total	**1.59**	**1.28**	**0.31**

Municipal taxes are not considered to be extra costs, however, they do entail an additional layer of harassment delay along the route, to be discussed in the recommendations section.

Unloading/parking is not considered to be an extra cost, it is a legitimate fee for use of the market area in Dakar.

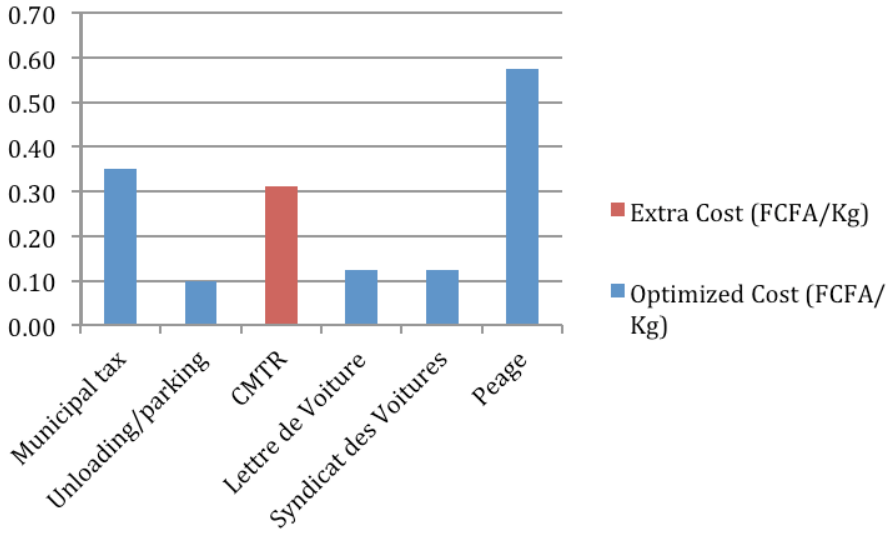
Lettre de Voiture This a legitimate cost and not considered to be an extra cost.

CMTR This charge is widely felt to be irrelevant as the CMTR provides few tangible benefits to drivers, it is therefore considered an extra cost.

Syndicat des Voitures Drivers felt that a valuable service was provided for this fee, there it is not considered to be an extra cost.

Road tolls are not considered to be extra costs, and are important in financing road maintenance.

EXTRA COSTS IN THE ADMINISTRATIVE CATEGORY



Extra costs amount to 0.31 FCFA/Kg, out of 1.59 FCFA/Kg of total administrative costs. In other words, 20% of administrative costs are considered to be extra costs.

3.2.2.5 INFORMAL

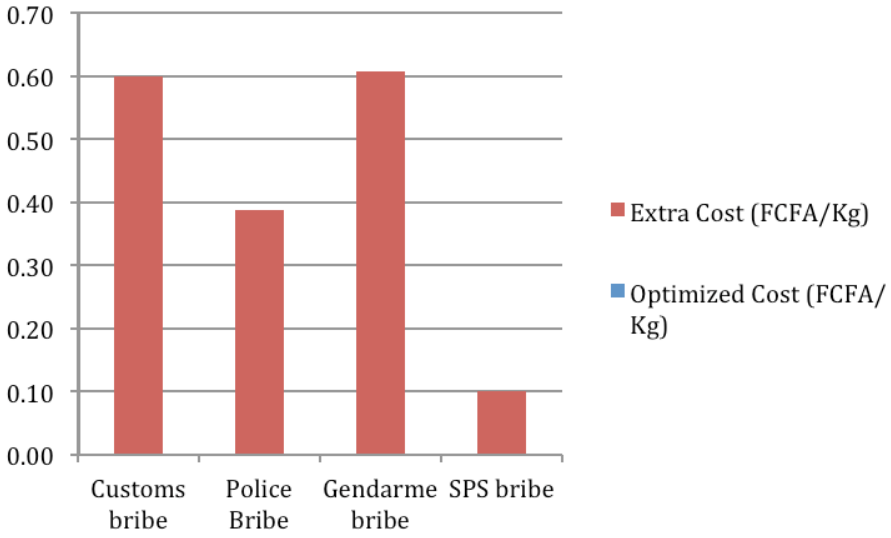
The following table summarizes the extra costs identified in the informal category.

COST ANALYSIS FOR THE INFORMAL CATEGORY

INFORMAL	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Customs bribe	0.60	0.00	0.60
Police Bribe	0.39	0.00	0.39
Gendarme bribe	0.61	0.00	0.61
SPS bribe	0.10	0.00	0.10
Total	**1.69**	**0.00**	**1.69**

All informal payments paid as bribes to control agents without receipt are considered as extra costs.

EXTRA COSTS IN THE INFORMAL CATEGORY



Extra costs amount to 100% of informal costs.

4. TRANSPORT COSTS ALONG THE BOBO DIOULASSO-OUAGADOUGOU CORRIDOR

4.1 TRANSPORT COSTS OBSERVED

4.1.1 ON FARM LOGISTICS

On farm logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
ON FARM LOGISTICS All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to: drying, shelling, cleaning, bagging, and on farm storage and handling costs	- On-farm loading charges - On-farm losses due to improper storage - On-farm shelling services - On-farm bagging services

4.1.1.1 LOSSES AND COSTS DURING SHELLING AND DRYING

No reliable data on post harvest losses was collected in the production zones near Bobo Dioulasso. Producers reported zero losses, which was not deemed credible. The reported losses by farmers in Niono has been used as a proxy.

As discussed above, post harvest the paddy rice[29] is threshed to remove the grains from the plant, then typically is dried on a tarpaulin ("bâche") in the sun. The key cause of loss during drying is from animals and birds eating the grains.

After drying, the rice is de-shelled mechanically. Typically the machine is brought to the farm and the producer pays for its usage. Many larger scale producers own their machines. (See picture below left). During mechanical de-shelling, losses are caused by the poor quality of the machine destroying the grains (see pictures).

[29] Rice still in its husk

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	LOSSES DURING DRYING AND SHELLING	6.00%[30]	20.40	6.91%	6.00%	FARMER

4.1.1.2 ON FARM STORAGE LOSSES

On farm storage losses in the Bobo Dioulasso region (Bama, the production zone nearby) were reported to be 1.75%.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	STORAGE LOSSES	1.75%	5.59	1.89%	1.65%	FARMER

4.1.1.3 ON FARM BAGGING

Plastic sacks of 100kg are purchased in Bama for 300 FCFA each, but are used by producers up to 4 times, giving an amortized cost of 0.75 FCFA/Kg.

Collectors were observed purchasing rice on farm and then re-bagging it into new sacks (discussed in market logistics section).

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BAMA	AMORTIZED SACK COST		0.75	0.25%	0.22%	FARMER

[30] As no reliable data was available in Bobo Dioulasso, a proxy from Niono has been assumed.

4.1.1.4 ON FARM LOADING CHARGES

Handling is included in the transport price from farm to market, which takes place on a donkey cart. No comparators were found to indicate the separate cost of loading onto the donkey cart so it has not been included in this analysis.

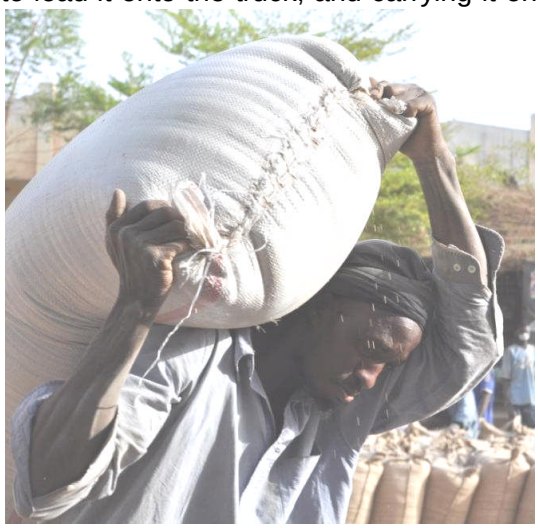
4.1.2 MARKET LOGISTICS

Market logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
MARKET LOGISTICS All formal and informal charges for non-transport services rendered throughout the logistics process.	- Loading and unloading charges (not including on farm loading) - Storage charges - Cost of bags - Re-bagging and sewing charges

4.1.2.1 HANDLING FEES

As discussed above, throughout Mali and Burkina Faso the price for loading or unloading a 100kg bag into or from a truck was consistently quoted as 50 FCFA. This process is entirely manual, with the handler lifting the sack on his head to load it onto the truck, and carrying it on his back to unload it (see right). Handling a 100kg sack manually is a very difficult and indelicate process, it is difficult for handlers to treat each sack with care so as not to cause rips and splits in the non-durable plastic material. For example, normally they are dropped or thrown to the ground rather than being placed. Traders cited manual handling practices as the key cause of sack breakage, which is the main source of in transit and storage losses[31] (discussed below).



Furthermore, the manual handling process is dangerous to the handlers. Handlers we spoke to experienced severe back and neck pain, and had witnessed serious accidents occurring. The average daily wage for a handler is just 1,500 FCFA, and they may lift up to a hundred 100 kg sacks per day.

From leaving Bama to arrival in Ouagadougou, a sack will be unloaded 2 times and loaded 2 times.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BAMA	LOADING	0.50	0.17%	0.15%	TRADER

[31] Traders were unable to estimate the rate of losses attributable to handling. All physical losses are included within storage losses (market logisitics) and in-transit losses (transport).

BOBO	UNLOADING	0.50	0.17%	0.15%	TRADER
BOBO	LOADING	0.50	0.17%	0.15%	TRADER
OUAGA	UNLOADING	0.50	0.17%	0.15%	TRADER
TOTAL		**2.0**	**0.68**	**0.60**	

4.1.2.2 BAGGING IN BAMA

Collectors bag the rice in Bama for onward sale to wholesalers in Bobo Dioulasso. Sacks cost 300 FCFA and filling and sewing costs 50 FCFA/Bag. Filling and sewing services are offered in Bama market.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BAMA	SACKS IN BAMA		3.00	1.02%	0.88%	TRADER
BAMA	FILLING AND SEWING		0.50	0.17%	0.15%	TRADER

4.1.2.3 BAGGING IN BOBO DIOULASSO

Wholesalers may re-bag rice in Bobo to replace worn bags, verify quality or re-package in smaller/more attractive bags. An assumed value of 200 FCFA for an empty 50Kg sack is used here.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BOBO	SACK COST	4.00	1.35%	1.18%	TRADER
BOBO	FILLING AND SEWING	0.50	0.17%	0.15%	TRADER

In Burkina Faso we only observed plastic sacks, which are non durable and can easily rip or break during handling, transit and storage. Exposure to the sun leads to degradation of the material. Generally these sacks are only used once, as they are not durable enough to be re-used. As mentioned, traders cited poor quality sacks as a key cause of losses[32], but are unable to source a better alternative for a reasonable price.

[32] Traders were unable to estimate the rate of losses attributable to sack quality. All physical losses are included within storage losses (market logisitics) and in-transit losses (transport).

Larger buyers such as OPAM and WFP specify particular types of bags to be used. For example, OPAM[33] specifies the use of jute sacks, which are much more durable than plastic sacks and so can be used for long term storage (more than 1 year). Unfortunately, jute sacks are very expensive, prices from 500-800 FCFA per sack were cited, so this too expensive for most traders without contracts with larger buyers.

Furthermore, traditional sewing methodology leads to rips in the sack, and is a key cause of holes from which losses occur[34].

As already staded in Section 3, the research team observed two instances where wholesalers used a portable automatic sewing machine to close bags after re-bagging. This process took just a few seconds and produced an even seam with no ripping. The wholesalers stated that this machine could be bought new for a cost of 150,000 FCFA, and generally lasted for 2-3 years.

4.1.2.4 REMOVAL OF IMPURITIES

Contrary to traders in Mali, impurities in rice in Burkina Faso were cited as the major quality concern by buyers in end markets. These impurities are as a result of poor post harvest handling practices and poor on-farm logistics equipment. The cost to remove these impurities is included within this category.[35]

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BOBO	CLEANING TO REMOVE IMPURITIES	5.00	1.69%	1.47%	TRADER

4.1.2.5 STORAGE COSTS- BOBO DIOULASSO

Observed storage facilities in Bobo were generally brick built with corrugated aluminum/brick roofs. Storage is assumed to take place for 1 month, traders did not report long term storage of rice.

Economies of scale were apparent in storage in Bobo Dioulasso, for example a 50% increase in capacity saves around 25% in storage costs per Kg.

[33] In the case of millet, but applicable to rice.
[34] Traders were unable to estimate the rate of losses attributable to sewing methodology. All physical losses are included within storage losses (market logisitics) and in-transit losses (transport).
[35] This is an assumed cost based on the cost to remove impurities from maize in Ouagadougou, as this data point was unavailable in Bobo Dioulasso. This cost corroborates with the same activity cost observed for millet and sorghum in Sikasso.

Location incurred	Item description	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Bobo	Storage in Bobo 1 month	0.88	0.30%	0.26%	Trader

Traders interviewed in Bobo stated that storage losses occurred, mainly due to rodents, insects, moisture as well as holes and rips in bags. The reported rate of storage losses was 7.5%, but only if storing long term. As traders interviewed did not store long term, we have assumed a rate of 3.75%, or half of this figure, as a reasonable estimate.

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Bobo	Storage losses in Bobo	3.75%[36]	11.72	3.97%	3.45%	Trader

4.1.2.6 STORAGE IN OUAGA

Observed storage facilities in Ouaga were similar to those in Bobo, generally brick built with corrugated aluminum roofs. Storage is assumed to take place for 1 month.

Location incurred	Item description	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Ouaga	Storage in Ouaga-1 month	0.69	0.23%	0.20%	Trader

4.1.2.7 STORAGE LOSSES IN OUAGA

Traders stated that while losses in storage occurred, they were unable to estimate the rate. Key causes of losses cited were rodents and rips/holes in bags. An average rate of loss of 2.41% has been assumed, based on the assumed rate for millet storage losses in Ouagadougou[37].

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Ouaga	Storage losses in Ouaga	2.41%[38]	7.25	2.45%	2.13%	Trader

[36] No estimates for losses in storage were available for the reported timescale. A figure of 7.5% was given for long term storage, we have assumed half of this figure, or 3.75% for short term storage.
[37] Please see E-ATP Millet and Sorghum Transport & Logistics Assessment, June 2011
[38] No estimates for losses in storage were available for Ouaga, and average of reported losses in Koutiala, Sikasso and Bobo Dioulasso has been used as a proxy.

4.1.3 TRANSPORT

Transport costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
TRANSPORT All formal and informal charges for transport services from farm to end market	- Transport fees/charges - Transport Agent Fee - Losses during transport

4.1.3.1 TRANSPORT FEES AND CHARGES

Transport fees and charges are direct fees paid to transport service providers. In the case of the segment from farm to Bama, this is done on a donkey cart rather than by truck. Also, apart from the farm-Bama segment, this price does not generally include handling, but it does include several official and informal costs paid along the road to control officials, including tolls, weigh stations police and gendarme bribes- this is discussed in the following section.

As mentioned in Section 3 above, it should also be noted that the observed professionalism of transporters was low, with many deliberately running trucks illegally, and having little respect for the labor rights of the drivers they employed. For example, it is the law[39] that an employer must pay into social security ("Caisse de Securite") for employees, and this is supposedly checked by border police agents as trucks pass though checkpoints. No truck owners interviewed provided this for their drivers, and many drivers stated they were rarely even paid their salary on time.

LOCATION INCURRED	ITEM DESCRIPTION	KM	FCFA /KG	FCFA /KG/KM	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
Bama	Transport cost farm to Bama	2	0.88	0.438	0.30%	0.26%	Trader
Bama-Bobo	Transport costs Bama to Bobo	30	10.00	0.052	3.39%	2.94%	Trader
Bobo-Ouaga	Transport cost Bobo-Ouaga	353	9.75	0.028	3.30%	2.87%	Trader

4.1.3.2 LOSSES IN TRANSIT

Losses in transit were reported between the farm and Bama, and the main causes were cited as handling practices and poor quality sacks, as well as sacks falling off the donkey cart. After the initial journey from to Bama, negligible losses in transport were reported along this rice trade corridor.

[39] Cited by border agents in Burkina Faso

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Bama	Losses in transport to Bama	0.50%	1.57	0.53%	0.46%	Trader

4.1.4 ADMINISTRATIVE

Administrative costs observed include:

Cost Category	Examples of costs observed
Administrative Charges All formal and informal charges for trade facilitation services (customs, taxes, weigh stations, export documentation, and customs and forwarding agent fees)	- Customs fees - Weigh station fees - Conseil Malien des Transporteurs Routiers - Entrepots Malien au Senegal - Road tolls - Municipal taxes

4.1.4.1 MUNICIPAL TAXES – BOBO DIOULASSO

Traders pay 100-125 FCFA per 100kg sack in municipal tax on exiting Bobo Dioulasso market.

Location incurred	Item description	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Bobo-Ouaga	Official costs Bobo-Ouaga	1.13	0.38%	0.33%	Trader

No other data on administrative costs was collected along this corridor.

4.1.5 INFORMAL

Informal costs observed include:

Cost Category	Examples of costs observed
Informal Payments Explicit bribes paid	- Bribes paid at checkpoints - Bribes paid at borders

Since trade in rice was not observed across international borders during the field research, no border bribes are included here.

4.1.5.1 BRIBES PAID AT CHECKPOINTS AND BORDERS

As already noted in section 3 above, road harassment and corruption are widely acknowledged as a problem in West Africa. Bribes are extracted by customs, police, gendarme and SPS services at the borders along the route. The research team collected data on bribes paid between Bobo and Ouagadougou from two sources, but this was not considered to be a large enough sample size. Instead, data for this segment has been taken from the latest IRTG

report.[40] As the IRTG reports deal with road harassment in detail, only headline figures are reported here. The report states that total bribes on the Koutiala-Bobo corridor are 140,338 FCFA, and on the Koutiala-Ouaga corridor are 207,224 FCFA, so the implied bribes paid between Bobo and Ouaga are 66,886 FCFA.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BOBO-OUAGA	INFORMAL COSTS BOBO-OUAGA		1.67[41]	0.57%	0.49%	TRANSPORTER

4.1.6 ITEMS NOT INCLUDED WITHIN TRANSPORT COST ANALYSIS

4.1.6.1 IMPURITIES

Contrary to traders in Mali, impurities in rice in Burkina Faso were cited as the major quality concern by buyers in end markets. These impurities are as a result of poor post harvest handling practices and poor on-farm logistics equipment. The average rate of impurities cited was **2.00%.**

4.1.6.2 WEIGHT DIFFERENCE

One of the main concerns of traders interviewed in Burkina Faso is that on arrival at their shop/warehouse, they find that the sacks of rice they purchased weigh less than what they thought they were purchasing. For example, the average weight difference for a traders interviewed in Burkina Faso is **4.56%,** meaning that on average for every 100 Kg sack purchased, it actually only contains approximately 95 Kg. See picture on the left, a 5 kg sack of rice weights 4.7kg in reality.

The cause of this weight difference is non- existent or inaccurate weighing equipment at the point of purchase. No scales were observed in rural markets in Burkina Faso such as Bama. Even in Bobo Dioulasso there were very few, if any, weighing scales in the market areas. Traders also thought that it could be a deliberate ruse on the part of producers to make more money. The effect of this issue is that buyers face major unreliability in purchasing, and this was consistently cited as a major concern. Traders may re-bag product so they can sell it on a more accurate weight, and may apply a systemic price discount to the suppliers as they assume that they will not receive the stated weight.

[40] 14ème Rapport de l'OPA/ UEMOA 1 October-31st December 2010, DRAFT Février 2011
[41] 14ème Rapport de l'OPA/ UEMOA 1 October-31st December 2010, DRAFT Février 2011, computed based on assumption of 40 T truck

4.2 TRANSPORT COSTS ANALYZED

4.2.1 OVERALL COST DRIVERS

The transport and logistics costs observed along the Bobo Dioulasso-Ouagadougou corridor have been described in detail above, the following table summarizes these costs.

DETAILED TRANSPORT AND LOGISTICS COSTS PER KG OF RICE TRAVELLING FROM BOBO TO OUAGA

Location incurred	Item description	%	FCFA/ Kg	% Farm gate price	% Final sales price	Borne by
Farm	Losses during drying and shelling	6.00%	20.40	6.91%	6.00%	Farmer
Farm	Storage losses	1.75%	5.59	1.89%	1.65%	Trader
	Farm price		295.42			
Bama	Amortized sack cost		0.75	0.25%	0.22%	Trader
Bama	Transport cost farm to Bama		0.88	0.30%	0.26%	Trader
Bama	Losses in transport to Bama	0.50%	1.57	0.53%	0.46%	Trader
Bama	Sacks in Bama		3.00	1.02%	0.88%	Trader
Bama	Filling and sewing		0.50	0.17%	0.15%	Trader
	Price in Bama		300.00			Trader
Bama	Loading		0.50	0.17%	0.15%	Trader
Bama-Bobo	Transport costs Bama to Bobo		10.00	3.39%	2.94%	Trader
Bobo	Unloading		0.50	0.17%	0.15%	Trader
Bobo	Cleaning to remove impurities		5.00	1.69%	1.47%	Trader
Bobo	Sack cost		4.00	1.35%	1.18%	Trader
Bobo	Filling and sewing		0.50	0.17%	0.15%	Trader
Bobo	Storage losses in Bobo	3.75%	11.72	3.97%	3.45%	Trader
Bobo	Storage in Bobo 1 month		0.88	0.30%	0.26%	Trader
	Sales price in Bobo		325.00			Trader
Bobo	Loading		0.50	0.17%	0.15%	Trader
Bobo-Ouaga	Transport cost Bobo-Ouaga		9.75	3.30%	2.87%	Trader
Bobo-Ouaga	Official costs Bobo-Ouaga		1.13	0.38%	0.33%	Trader
Bobo-Ouaga	Informal costs Bobo-Ouaga		1.67	0.57%	0.49%	Transporter
Ouaga	Unloading		0.50	0.17%	0.15%	Trader
Ouaga	Storage in Ouaga- 1 month		0.69	0.23%	0.20%	Trader
Ouaga	Storage losses in Ouaga	2.41%	7.25	2.45%	2.13%	Trader
	Sales Price in Ouaga		340.00			Trader

Source: Field interviews and calculations

The following table presents these costs summarized by cost type:

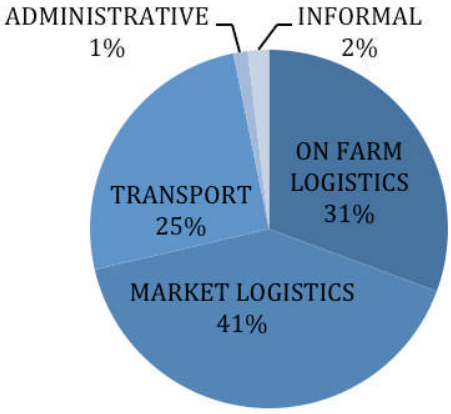
SUMMARY OF TRANSPORT AND LOGISTICS COST PER KG OF RICE TRAVELLING BETWEEN BOBO AND OUAGA

	FCFA/KG	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	26.74	**9.1%**	**7.9%**
MARKET LOGISTICS	35.53	**12.0%**	**10.4%**
TRANSPORT	22.20	**7.5%**	**6.5%**
ADMINISTRATIVE	1.13	**0.4%**	**0.3%**
INFORMAL	1.67	**0.6%**	**0.5%**
Total	**87.26**	**29.5%**	**25.7%**

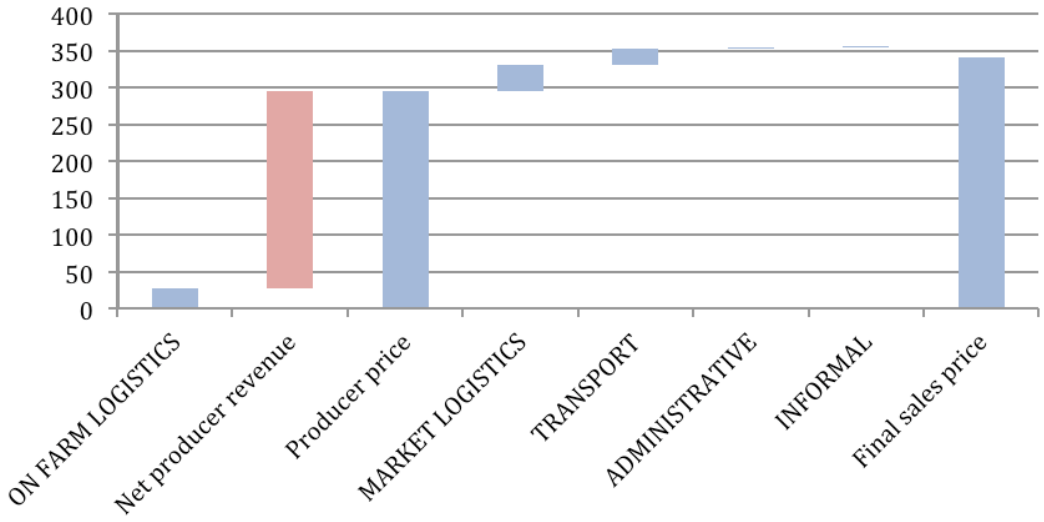
The total transport and logistics costs account for 87.26 FCFA/Kg of rice travelling from Bobo to Ouagadougou, which equates to 29.5% of farm gate price and 25.7% of final end market price.

As can be seen from the pie chart below, the most important drivers of transport and logistics costs are on market logistics costs, which represent 41% of the total costs, and on farm logistics costs, which represent 31% of the total costs.

COMPONENTS OF TOTAL TRANSPORT AND LOGISTICS COSTS



STEP CHART OF TRANSPORT AND LOGISTICS COSTS BY CATEGORY



Please note that net producer revenue does not include any other production costs.

4.2.2 PHYSICAL LOSSES

Description	Observed loss	Indicative weight (Kg)	Cumulative loss
Losses during drying and shelling	6.00%	0.94	6.00%
Storage losses	1.75%	0.92	7.65%
Losses in transport to Bama	0.50%	0.92	8.11%
Storage losses in Bobo	3.75%	0.88	11.55%
Storage losses in Ouaga	2.41%	0.86	13.68%
Total			**13.68%**

Cumulative physical losses are 13.68% along the logistics chain.

4.2.3 EXTRA COST ANALYSIS

This section analyzes each observed cost in terms of optimized and extra costs

4.2.3.1 ON-FARM LOGISTICS

The following table summarizes the extra costs identified in the on-farm logistics category.

COST ANALYSIS FOR THE ON FARM LOGISTICS CATEGORY

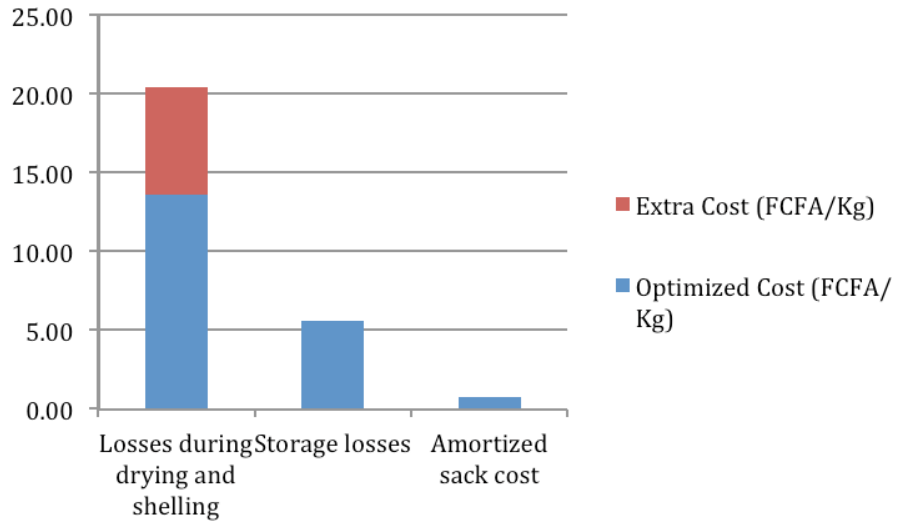
ON FARM LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Losses during drying and shelling	6.00%	20.40	13.60	6.80
Storage losses	1.75%	5.59	5.59	0.00
Amortized sack cost		0.75	0.75	0.00
Total		**26.74**	**19.94**	**6.80**

Losses during drying and shelling are observed to be 6.00%. In discussions with value chain leaders on the IICEM project, the acceptable level of losses during this post harvest handling is 4%, which is monetized to a cost of 11.82 FCFA/Kg.

On farm storage losses are observed to be 1.75%. In discussions with value chain leaders on the IICEM project, the acceptable level of losses during this on farm storage is 2%, so this is not considered to be an extra cost.

Amortized sack costs are observed to be 0.75 FCFA/Kg, there is no basis for estimation of extra costs in this category

EXTRA COSTS IN THE ON FARM LOGISTICS CATEGORY



Extra costs amount to 6.80 FCFA/Kg, out of 26.74 FCFA/Kg of total on farm logistics costs. In other words, 25% of on farm logistics costs are considered to be extra costs.

4.2.3.2 MARKET LOGISTICS

The following table summarizes the extra costs identified in the market logistics category.

COST ANALYSIS FOR THE MARKET LOGISTICS CATEGORY

MARKET LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Sacks in Bama		3.00	2.25	0.75
Filling and sewing		0.50	0.35	0.15
Cleaning to remove impurities		5.00	0.00	5.00
Handling		2.00	2.00	0.00
Sack cost		4.00	0.00	4.00
Filling and sewing		0.50	0.00	0.50
Storage losses in Bobo	3.75%	11.72	0.00	11.72
Storage in Bobo 1 month		0.88	0.70	0.18
Storage in Ouaga- 1 month		0.69	0.00	0.69
Storage losses in Ouaga	2.41%	7.25	5.80	1.45
Total		**35.53**	**11.10**	**24.43**

Sacks in Bama Similar sacks were observed for sale in Mali for as low as 225 FCFA/Kg. Therefore, this is assumed to be the optimized cost.

Filling and sewing costs are observed to be 0.5 FCFA/Kg. As noted in section 3 above, the research team observed instances of use of automatic handheld sewing machines, which produced a high quality seam in no more than a few seconds, could be purchased for 150,000 FCFA and last approximately 2 years. A prudent estimate of 150 bags sewn per week results in a per Kg cost of 0.10 FCFA (See table in section 3.2.2.2 above)

Based on the cost of loading a 100kg sack, 0.5 FCFA/kg, it can be assumed that filling a sack (a much less strenuous and less skilled job) should be no more than 0.25 FCFA/kg.

In total, the assumed optimized cost for filling and sewing a bag on farm should be 0.25+0.1= 0.35 FCFA/kg.

Handling no basis for estimating extra costs for this item.

Cleaning to remove impurities to achieve the best price premium and demands of buyers, impurities should be negligible, and there subsequently should be no need for the trader to remove them before sale.

Purchase of sack/filling and sewing In an optimized scenario there should be no need to re-bag rice again after leaving the farm. Ideally, one bag should be used only once and throughout the entire export operation. Therefore these costs are considered as extra costs.

Storage in Bobo Prices quoted in Bobo are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. Modern large-scale warehousing facilities were not readily available in the market. A discount of 20% has been assumed as a proxy for

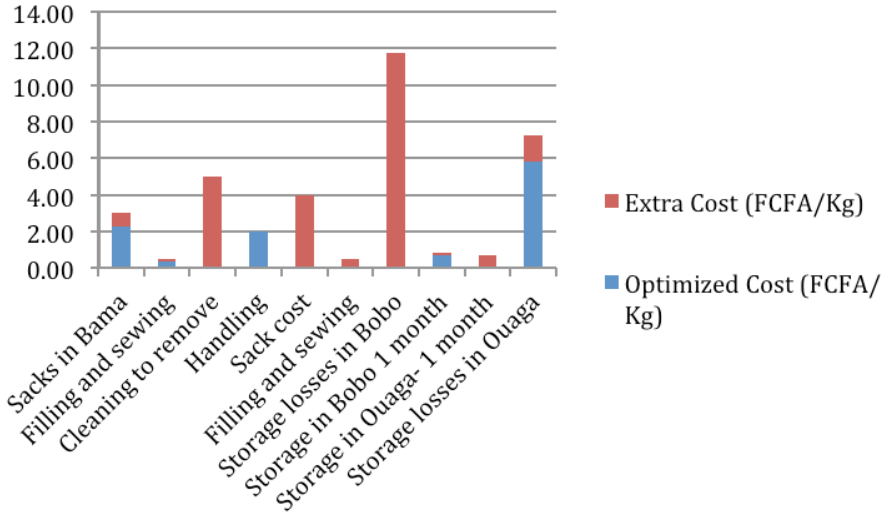
potential reduced costs if a higher volume of product is stored and a commercial storage market is developed.[42]

Losses in storage in Bobo The research team observed instances of use of simple storage techniques such as aeration palettes and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.

Storage in Ouaga Prices quoted in Bamako are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. Modern large-scale warehousing facilities were not readily available in the market. A discount of 20% has been assumed as a proxy for potential reduced costs if a higher volume of product is stored and a commercial storage market is developed.[43]

Losses in storage in Ouaga The research team observed instances of use of simple storage techniques such as aeration palettes and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.

EXTRA COSTS IN THE MARKET LOGISTICS CATEGORY



Extra costs amount to 24.43 FCFA/Kg, out of 35.53 FCFA/Kg of total market logistics costs. In other words, 69% of market logistics costs are considered to be extra costs.

4.2.3.3 TRANSPORT

The following table summarizes the extra costs identified in the transport category.

[42] See ATP Maize Transport and Logistics assessment, Dave Schacht.
[43] See ATP Maize Transport and Logistics assessment, Dave Schacht.

COST ANALYSIS FOR THE TRANSPORT CATEGORY

TRANSPORT	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Transport cost farm to Bama		0.88	0.10	0.77
Losses in transport to Bama	0.50%	1.57	0.00	1.57
Transport costs Bama to Bobo		10.00	1.02	8.98
Transport cost Bobo-Ouaga		9.75	9.75	0.00
Total		**22.20**	**10.87**	**11.32**

TRANSPORT COSTS PER KG/KM

Segment	KM	FCFA/Kg	FCFA/Kg/KM
Farm to Bama	2	0.88	0.438
Bama to Bobo	30	1.50	0.050
Bobo to Ouaga	353	9.75	0.028

Farm to Bama transport cost Observed costs in this category are 0.88 FCFA/Kg, for an assumed 2km journey from farm to Bama. This transit is undertaken in donkey carts, and includes handling. As can be seen from the table above, the cost per Kg/Km for this segment are extremely high in comparison with subsequent segments.

This could be caused by several plausible reasons including short distance and small shipments leading to low economies of scale, relative bargaining power of farmers, and low supply of carts.

Taking the transport cost per Kg/Km from Segou to Bamako of 0.050 as a proxy for a more efficient transport market, perhaps using trucks instead of donkey carts, the implied optimized cost for the farm to consolidation segment is 0.10 FCFA/Kg.

Bama to Bobo transport costs The observed transport cost for this 108km segment is 0.050 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)[44] suggest that average transport prices for long distances (1000+ km) in West Africa per kg/km are 0.034 FCFA.[45] Transport costs for this segment are likely elevated for the same reasons as above, market inefficiency and lack of economies of scale. Taking this transport cost per Kg/Km over long distances in West Africa as a proxy for a more efficient transport market for this 30 Km distance, the implied optimized cost for the farm to consolidation segment is 1.02 FCFA/Kg.

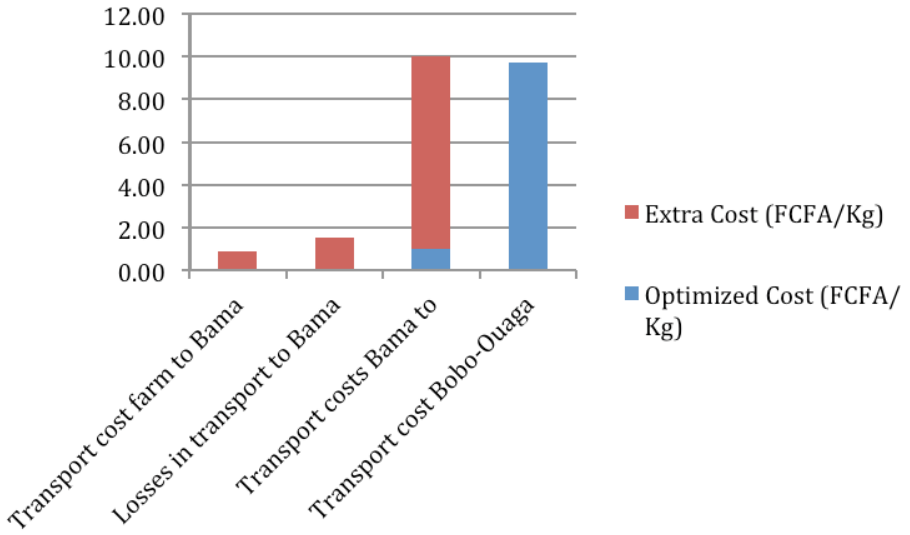
Bobo to Ouaga transport costs The observed transport cost for this segment is 0.028 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)[46] suggest that this price is actually quite reasonable in comparison with other markets. For example, according to their study, transport prices in Western Europe are approximately 0.024 FCFA/Kg/Km[47], and

[44] Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008
[45] In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/$.
[46] Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008
[47] In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/$.

in the US are 0.019 FCFA/Kg/Km[48]. Therefore, we find that there are no extra costs in this category.

Losses in transport Losses in transport are as a result of poor handling, poor packaging and poor trucks. All losses in transport are considered and unnecessary and therefore extra costs.

EXTRA COSTS IN THE TRANSPORT CATEGORY



Extra costs amount to 11.32 FCFA/Kg, out of 22.20 FCFA/Kg of total transport costs. In other words, 51% of transport costs are considered to be extra costs.

4.2.3.4 ADMINISTRATIVE

The following table summarizes the extra costs identified in the administrative category.

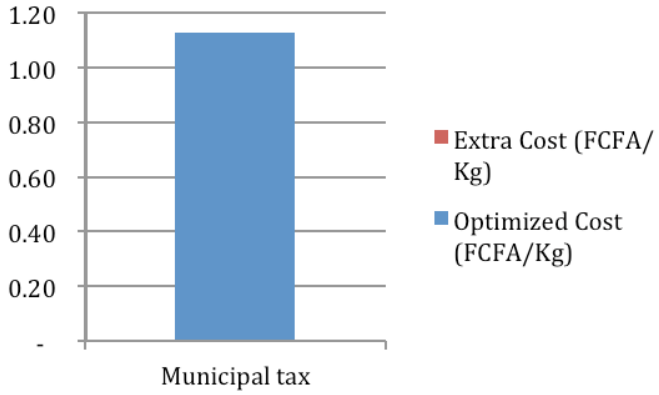
COST ANALYSIS FOR THE ADMINISTRATIVE CATEGORY

ADMINISTRATIVE	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Municipal tax	1.13	1.13	0.00
Total	**1.13**	**1.13**	**-**

Municipal taxes are not considered to be extra costs, however, they do entail an additional layer of harassment delay along the route, to be discussed in the recommendations section.

[48] In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/$.

EXTRA COSTS IN THE ADMINISTRATIVE CATEGORY



There are no extra costs in this category.

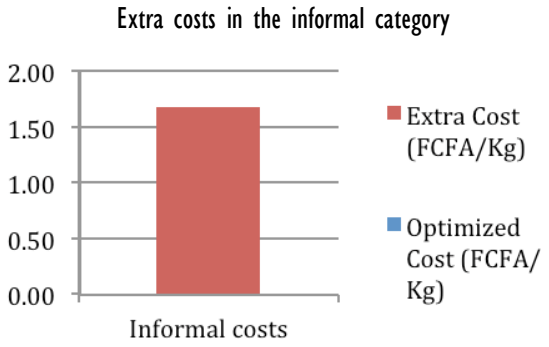
4.2.3.5 INFORMAL

The following table summarizes the extra costs identified in the informal category.

COST ANALYSIS FOR THE INFORMAL CATEGORY

INFORMAL	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Informal costs	1.67	0.00	1.67
Total	**1.67**	**0.00**	**1.67**

All informal payments paid as bribes to control agents without receipt are considered as extra costs.



Extra costs amount to 100% of informal costs.

5. CONCLUSIONS

1. **Trade across borders in rice was not observed during this study**

   Although this study called for an assessment of transport and logistics costs rice along the Bobo Dioulasso – Segou – Bamako – Dakar corridor, no trade in rice was observed between Kayes and Dakar, or between Segou and Bobo Dioulasso with traders stating that the price differential between the markets was insufficient to cover the high perceived transport costs and produce an adequate margin. Traders also cited periodic export bans on cereals as a further key reason they did not engage in cross border trade, and sourced their rice from local production zones. Furthermore, the poor quality of rice produced in Mali was cited as a reason it was not demanded in Dakar, where imports from outside the region were available and very popular.

   The research team did observe trade in rice from Bobo-Dioulasso (a rice production zone to Ouagadougou. For completeness, this study has assessed transport and logistics costs along 2 separate rice corridors: Niono (Segou) to Kayes, and Bobo Dioulasso to Ouagadougou.

2. **Transport and logistics costs represent 25%[49] of end market price. Extra costs observed represent 11%[50] of end market price.**

   The following table highlights the main findings from the transport and logistics cost analysis:

KEY FINDINGS FROM TRANSPORT AND LOGISTICS COST ANALYSIS

	KM	Total Transport and logistics costs FCFA	% Producer price	% Final sales price	Extra costs FCFA	% Extra costs over observed costs	% Extra costs of final sales price
Niono-Kayes	964	70.84	25.95%	24.57%	28.21	39.82%	9.40%
Bobo-Ouaga	385	87.26	29.54%	25.67%	44.22	50.68%	13.01%
Average	**675**	**79.05**	**27.74%**	**25.12%**	**36.21**	**45.25%**	**11.20%**

With transport and logistics costs representing an average of 25% of final end market price, it is not surprising that cross border trade in rice is limited, with trade only taking place on the basis of high enough price differentials between markets to cover these high costs.

Furthermore, an analysis of extra costs (i.e. the portion of observed cost that is considered, unnecessary, unjustified or too expensive) shows that an average of 45% of total observed transport and logistics costs are extra costs, and that 11% of the end market price is represented by extra costs

[49] An average over the 2 corridors studied
[50] An average over the 2 corridors studied

Transport and logistics inefficiencies are thus extremely significant, and improving the efficiency of the transport and logistics chain represents huge potential for improving economic incentives for intraregional trade and increasing regional price arbitrage. In the face of rising fears about food insecurity and vulnerability to external price shocks, this finding is tremendously important.

3. **On-farm logistics represent up to 41%[51] of total transport and logistics costs**

ON FARM LOGISTICS COSTS

On Farm Logistics	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Niono-Kayes	28.83	40.69%	10.56%	10.00%	7.94	27.53%
Bobo-Ouaga	26.74	32.14%	9.05%	7.87%	6.80	25.43%

On-farm logistics costs are driven by losses during drying, shelling and storage, and on farm bagging and handling. While improved production practices and increased yields are important, it is also clear that improved post harvest handling techniques and access to better on farm logistics equipment would also result in improved farmer incomes, better quality product and lower end market prices as up to 50%[52] of on farm logistics costs were found to be inefficient.

4. **Transport costs represent up to 27%[53] of total transport and logistics costs**

TRANSPORT COSTS

Transport	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Niono-Kayes	19.37	27.34%	7.09%	6.72%	4.26	22.01%
Bobo-Ouaga	22.20	25.43%	7.51%	6.53%	11.32	51.00%

Transport costs are driven by direct prices paid for transport services and losses during transit. Over longer distances (i.e. between Bamako and Kayes) transport prices were found to be relatively low in comparison with global benchmarks.[54] However, over shorter distances, transport prices were found to be high, especially between farm and consolidation point, where on a Kg/Km basis costs were up to 100 times higher than over longer distances.[55] Transport prices were found to be seasonal, based on crop calendars which dictate the demand for trucking services. Furthermore, significant physical losses in transit occur, which are mainly caused by handling practices as well as poor quality bags.

[51] For rice Niono-Kayes
[52] For rice Bobo-Ouaga
[53] For rice Niono-Kayes
[54] Global benchmarks were sourced from Teravanithorn and Rallaband: Transport Prices and Costs in Africa, The World Bank 2008.
[55] For rice travelling from farm to Niono

Up to 51%[56] of transport costs were found to be extra costs, therefore reducing transport costs and losses in transit, as well as improving trucking market information availability could have a significant effect on the efficiency and competitiveness of the value chain.

5. **Market logistics costs represent up to 41%[57] of total transport and logistics costs**

MARKET LOGISTICS COSTS

Market Logistics	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Niono-Kayes	19.36	27.33%	7.09%	6.72%	14.00	72.32%
Bobo-Ouaga	35.53	42.69%	12.03%	10.45%	24.43	68.76%

Market logistics costs are driven by handling fees, storage costs and losses, separation of grains and re-bagging. Market storage losses were shown to be avoidable by implementing simple and cheap techniques to improve aeration and reduce pests, but are still occurring on a widespread basis. Extra costs in market storage[58] represent up to 17%[59] of total observed transport and logistics costs. Rebagging, which takes place to verify quality, remove impurities, separate broken grains as well as replace worn sacks should also be an avoidable cost given efficient post harvest handling and on-farm bagging using higher quality sacks which are durable enough to survive throughout the value chain. Overall, a very significant portion, up to 72%,[60] of market logistics cost are considered to be extra costs, and improvements in market logistics processes and infrastructure have a great potential to improve efficiency in the transport and logistics chain.

6. **Informal costs represent up to 2% of total transport and logistics costs**

INFORMAL COSTS

Informal	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Niono-Kayes	1.69	2.39%	0.62%	0.59%	1.69	100.00%
Bobo-Ouaga	1.67	2.01%	0.57%	0.49%	1.67	100.00%

Informal costs, i.e. bribes extracted along the corridors at checkpoints by customs, police, gendarme and SPS operatives, make up only a small portion of observed costs and end market price, but are 100% inefficient in terms of the extra cost analysis. Among the many widely acknowledged ills of road corruption in this region, these informal costs pose a highly visible and divisive barrier to trade. Furthermore, since both legal and illegal trucks are made to pay bribes irrespective of their documentation or truck maintenance, for example, this disincentivizes good quality transport service operations, and creates additional inefficiencies.

[56] For rice Bobo- Ouaga
[57] For rice Bobo-Ouaga
[58] Includes the portion of storage cost considered too expensive, and all storage losses in market zones.
[59] For both corridors
[60] For rice Niono-Kayes

7. Administrative costs represent up to 2%[61] of total transport and logistics costs

ADMINISTRATIVE COSTS

Administrative	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Niono-Kayes	1.59	2.24%	0.58%	0.55%	0.31	19.69%
Bobo-Ouaga	1.13	1.35%	0.38%	0.33%	0.00	0.00%

Although administrative costs make up just 1-2% of total transport and logistics cost, inefficiencies in this category need to be addressed. The main drivers of administrative costs on both corridors are municipal taxes. There are several procedures/ administrative costs that need to be reviewed and perhaps eliminated. For example, the CMTR extracts fees from transporters, but they do not see any value-add for this charge. Moreover, these costs and procedures add additional layers of bureaucracy to trade, increasing the burden on trader and transporters, and reducing incentives to engage in legal trade.

8. Quality and reliability represents a significant barrier to increased intra-regional trade

Throughout the value chain, and especially in the end markets of Dakar and Ouagadougou, traders stated that poor quality and unreliability of regionally sourced rice was a significant problem. In Dakar, for example, traders stated a preference for imported rice (from Asia, for example), citing rice sourced from Mali to be low quality, with many impurities. Major buyers, such as OPAM in Mali, has specific quality clauses in their contracts with wholesalers. Major processors, such as Brakina breweries, also have stringent quality demands, and only contract with selected trusted suppliers. Quantitative analysis shows that up to 2%[62] of rice trades is made up of impurities, and quality concerns entails further costs due to the need to inspect, clean and re-bag the rice. Furthermore, reliability concerns, particularly in Burkina Faso arise from the lack of adequate weighing equipment lead to weight differences on purchase of up to 4.56%[63]. This weight different was the most widely cited problem for traders interviewed. From the transport cost analysis, poor quality and unreliability of product accounts for up to 13%[64] of total transport and logistics costs, all of which is considered extra cost. The potential market for regionally produced products could be greatly expanded if quality and reliability could be improved through improved post-harvest handling practices, improved hygiene, better logistics procedures and formalizing trade in the sector.

[61] For rice Niono-Kayes
[62] For rice Bobo-Ouaga
[63] For Rice Bobo-Ouaga
[64] This includes costs to remove impurities, costs to separate broken grains and re-bagging on the Niono-Kayes corridor

6. RECOMMENDATIONS

1. Assistance with procurement of on farm logistics equipment

A key driver of cost, losses and reduced quality of rice is lack of access to good quality market logistics equipment, including de-shelling machines and weighing equipment.

- o Pilot access to finance for farmers

  E-ATP could pilot access to finance programs for farmers to procure high quality de-shelling machinery. Cost savings could be extremely significant (see section 3 above). Simple business plans could be put in place for either individual purchase (for larger scale farmers), or group purchase, perhaps by producer cooperatives. Financing could be secured on the asset, and/or through a warehouse receipts scheme (see below).

- o Partnership with equipment provider

  The research team identified an equipment supplier in Bamako[65] with capability for export regionally. E-ATP could work with equipment providers such as this, to supply equipment to regional producers on a bulk or low cost basis. E-ATP could seek out further equipment suppliers, perhaps going directly to the equipment producers.

2. Producer capacity building

Quality issues are a significant problem for traders in the rice value chain, and an important constraint to expanded intra-regional trade. Traders cited they would be willing to pay a significant premium for better quality products. On-farm storage losses are also significant, but easily avoidable.

- o Training on post harvest handling

  Simple measures such as drying grains out on a tarpaulin, protecting them from pests, protecting grains from breaking and ensuring no impurities are accidentally introduced would be beneficial alongside awareness building on the potential price premiums that could be obtained by implementing these practices (and ending the widely cited practice of farmers adding weight to bags deliberately). Any producer training already being implemented by the project should include this element.

[65] Contact details will be separately provided to the E-ATP project

- Capacity building for cooperatives to encourage formal contracting with buyers

  Major buyers in the region set specific quality demands in their contracts with their suppliers, however contracting is not the status quo amongst the majority of value chain actors, particularly producers. The research team observed one successful example of a producer cooperative that was able to secure a contract to supply cereals to a wholesaler, which included quality clauses. Formally introducing buyer led demands on producers in this way is one solution to the quality and unreliability problem.

- Training on best practice storage techniques

  Storage best practices such as use of palettes to improve aeration, application of insecticides to reduce insects and controlling rodents were observed to reduce on farm storage losses by a significant amount. Training on these simple and easy to implement practices, as well as the potential benefits of employing them could reduce storage losses to an acceptable level. Further research into the costs of implementing these measures (amortized palette and insecticide cost, for example) vs. potential cost savings should be carried out.

3. Assistance with procurement of weighing equipment in market areas: pilot program in Bobo Dioulasso

Lack of weighing equipment is a major cause of extra costs. This problem was observed to be particularly significant in Bobo Dioulasso, but was also a problem in Niono and may well be a problem in other areas of the region.

- Access to finance (on an individual/market level)

  E-ATP could pilot an access to finance programs for certain market areas in the Bobo-Dioulasso region such as Bama, Banzon and Bobo Dioulasso itself. Cost and efficiency savings could be extremely significant (see section 4 above). Simple business plans could be put in place for either individual purchase (by market traders), or collective purchase, perhaps by the market association. Financing could be secured on the assets, and/or through a warehouse receipts scheme (see below).

- Awareness building on use of standard weights to ensure weighing accuracy

  In conjunction with procurement of weighing equipment, the use of standard weights should also be encouraged. This was observed to be standard practice in markets visited in Mali, where traders would prove the accuracy of their scales to buyers by using standard 5-10Kg weights. This is a very cheap and easy method of improving reliability and buyer confidence.

- Partnership with equipment supplier

  The research team identified an equipment supplier in Bamako[66] with capability for export regionally. E-ATP could work with equipment providers such as this, to supply weighing equipment to regional markets on a bulk or low cost basis. E-ATP could seek out further equipment suppliers, perhaps going directly to the equipment producers.

4. Pilot partnership in branding high quality, accurately weighed products

Low quality and reliability have been identified as significant issues and constraints to increased regional trade, with buyers along the value chain stating they would be willing to pay a premium for high quality and reliable supply. The research team has identified two potential partners interested in investing in the production of high quality, zero impurity, accurately weighed cereals for sale to mass markets. These cereals would be packaged in attractively designed sacks, with clear information on the quality and accurate weight of the product inside, to communicate that this it is a premium product. Expansion and scaling up of initiatives like this regionally would help to disseminate the message to the bottom of the value chain that quality and reliability is important and that buyers are willing to pay a premium.

Although neither of these potential partners currently works in the rice value chain, the concept for rice weighing and packaging is so similar to other cereals that it could be scaled up easily to rice.

- Pilot partnership with animal feed producer

  An animal feed producer based in Ouagadougou, already has business a plan to produce bags of high quality maize, electronically weighed in specially branded bags. The bags the animal feed producer has designed are branded “Mais pur, 0% impurities, 50 kg”. He has plenty of space and capacity in his existing warehouse to implement this, and since he already produces his animal feed in special bags, he has the right supply connections to implement this initiative (for instance he has an existing business relationship with a bag maker/printer). He even has idle machinery. He stated the only thing he is lacking is financing and business support.[67]

- Pilot partnership with wholesaler

  A wholesaler based in Ouagadougou,expressed interest in expanding her existing cereals cleaning and re-bagging operations in a similar vein to the animal feed processor above. E-ATP already has a good working relationship with this wholesaler.[68]

[66] Contact details will be separately provided to the E-ATP project
[67] Contact details will be separately provided to the E-ATP project
[68] Contact details will be separately provided to the E-ATP project

5. Business plan for reduced sack weight

Manual handling of 100kg sacks is not only difficult and dangerous to the handlers, but also means that the non-durable, stuffed full sacks are not treated delicately and often break open or rip as a result. For example, they are normally thrown/dropped down to the ground rather than being placed.

E-ATP could work with existing contacts in the sack producing sector (such as Embal Mali) to explore the feasibility of introducing a wider range of lower sack weights to the rice sack market. E-ATP could work to facilitate linkages between sack producers and handlers, such that handler could sell sacks (of lower weight) straight to traders in markets.

6. Partnerships in jute sacks/feasibility study

Poor quality, non durable sacks are cheap to buy but lead to many extra costs in the value chain including physical loss of product and the need to re-bag to replace work out sacks. They are typically only used once. Many traders cited jute sacks as a better alternative, but stated that they were prohibitively expensive. For example, a plastic sack costs around 200-250 FCFA, in comparison with a jute sack at 600-800 FCFA. However, jute sacks are more durable, if used from the beginning of the value chain could negate the need for re-bagging and can be re-used several times. They are also more suitable for long term (1 year +) storage.

- o <u>Feasibility study</u>

  E-ATP could conduct a feasibility study on the introduction of jute sacks (possibly of lower weight, see recommendation 5) to the rice market, looking at market interest, ways to reduce consumer cost, and suitability for rice.

- o <u>Partnership with buyers</u>

  OPAM insists that its suppliers use jute sacks, and sells these to wholesalers as part of their contract. Wholesalers re-bag their millet and sorghum into the specially provided bags before delivery to OPAM. This was the only instance where jute sacks were observed to be in use for millet and sorghum on the corridors studied. This was only made possible because the cost of the jute sacks was built into the price paid by the buyer. On the other hand, we also observed a producer who had a contract with the WFP, and they directly provided the requisite good-quality, branded sacks.[69] Other larger buyers may be interested in this type of arrangement. E-ATP should work with its network of buyers in the region to assess their willingness to implement buyer-led initiatives such as these.

7. Assistance with procurement of in-market portable sewing machines

Traditional sewing methods are not only expensive, but also are a key cause of rips in sacks from which losses occur. The research team observed two instances of use of

[69] Please note that these were not jute sacks, but high grade plastic sacks.

portable automatic sewing machines (known as bag closing machines) which produced a much better seal to the sacks. Section 3 above shows that portable sewing machines could also be very cost effective, reducing costs to traders for this service.

- o Partnership with equipment supply companies

  The bag closing machines observed were made by the following companies (both based in India:

  - Daichi
  - Citizen

  E-ATP could seek to partners with these suppliers to encourage them to sell directly to market operators, perhaps by negotiating standard contracts.[70]

- o Access to finance

  E-ATP could pilot an access to finance programs for certain market areas in the region to encourage the purchase of these devices. Cost and efficiency savings could be extremely significant (see section [?]) above). Simple business plans could be put in place for either individual purchase (by market traders), collective purchase by a group of trader, or even an entrepreneur who wishes to sell this service to market operators (perhaps handlers could also provide this service). Financing could be secured on the assets, and/or through a warehouse receipts scheme (see below).

8. Training on best practice storage techniques for market traders

Unnecessary storage losses are occurring in market areas.

- o Training and awareness building on best practice storage techniques

  Storage best practices such as use of palettes to improve aeration, application of insecticides to reduce insects and controlling rodents were observed to reduce on market storage losses to a negligible level. Training on these simple and easy to implement practices, as well as the potential benefits of employing them could reduce storage losses to an acceptable level. Further research into the costs of implementing these measures (amortized palette and insecticide cost, for example) vs. potential cost savings should be carried out.

- o Partnerships with buyers

  The research team observed one instance where the WFP had provided financing to build a purpose-built warehouse, provided palettes and insecticides (as well as good quality sacks), and gave training on best practice storage

[70] A brief internet search turned up the following website, which lists many other companies which could supply this type of bag closing equipment:
http://catalogs.indiamart.com/products/portable-bag-closer-machine.html

techniques (such as storing bags away from walls) to a supplier who had contracted with them. This is a good example of a buyer-led initiative to ensure high quality storage of products in their supply chain, improve quality and reliability. E-ATP should work with its network of larger buyers to assess their willingness to participate in similar initiatives.

9. WRS pilot expansion

ATP has piloted a Warehouse Receipts Scheme in Ghana, and a need was observed for this type of scheme along the corridors observed during this study. Not only because high quality, purpose built warehousing is scarce, but also because it could improve access to credit to purchase equipment such as de-shelling machines, weighing scales and portable bag sewing machines as recommended above.

10. Pilot market information and export promotion centers

- Traders

  Traders expressed difficulty in obtaining appropriate export documentation, lack of information on the existence of export bans and for those who did not already engage in cross border trade, a lack of knowledge about where to begin. In addition, while cell phones and personal networks make finding information on pricing much easier than previously, on large scale basis information on average pricing at various regional markets is difficult to obtain.

  E-ATP could pilot the implantation of market information centers that could provide this information to traders, as well as the required documentation. These centers could also provide training and information on best practice storage and handling techniques, as well as advice on contracting- such as providing pro-forma contracts.

  These centers could be set up as a PPP, with a private sector operator providing this service. A feasibility study into whether these centers could be self sustaining, for example through user fees, could be done.

- Transporters

  Furthermore, truckers were often confused or unaware of their obligations regarding appropriate documentation for their vehicles and their rights and obligations for various payments (official and non official) per journey. Market information centers could also provide advice and documentation for transporters.

11. Professionalization transport sector, training for drivers on their rights

Lack of professionalism and informality in the transport sector is a key cause of inefficiency. Lack of respect for labor rights mean that drivers and other operatives are not treated fairly, and lack of awareness of drivers of their rights with respect to control officials perpetuates the problem of road harassment.

A fully formal and professional transport sector is a long way from happening, but E-ATP should focus where possible on improving awareness of the issues through its information dissemination and advocacy activities (such as IRTG/OPA and Borderless), with particular focus on reaching out to drivers and those who are on the front lines of trucking services.

Furthermore, a key cost driver in the administrative cost category was axel load fines, due to overloading. ATP should continue with efforts to eliminate this problem, including pursuing the PPP recommendation for reduced truck axel weight highlighted in the ATP maize transport and logistics assessment.

12. Advocacy for streamlining border and control procedures

Border and control procedures are repetitive and not streamlined. At the border the various agencies such as Customs, Gendarme, and Police do not work together coherently, with the same checks and procedures being repeated many times over. For example a driver may be asked for his *lettre de voiture* or truck papers by each agency, on *both* sides of the border. Advocacy to streamline procedures, for better division of responsibility at borders (each agency checking separate things). Furthermore, along the road municipal taxes are extracted as a separate checkpoint, this could be collected at toll booths to remove this additional stop/slowdown for trucks.

13. Advocacy for review of certain official costs

The following official charges were found to be of questionable value and show be reviewed, perhaps eliminated. E-ATP should advocate for this.

- CMTR “ristourne”
- EMAS (Entrepots Malien au Senegal)
- Travail supplementaire
- Statistical taxes

The existing application of the Passavant at the border should be eliminated as this is no longer legal under ECOWAS.

14. Expansion of intra-regional “bourse” trade fairs

Bourses were highlighted by several value chain stakeholders as an extremely effective means of building formal supply/customer relationships. ATP already sponsors these events, but should consider expanding them within the region or increasing their frequency.

6.1 ANNUAL UPDATES TO BASELINE COST DATA

It is not recommended that cost data variables identified in this study be updated annually as specified in the terms of reference. The study team does not believe that this activity is a cost effective method of monitoring any transport and logistics cost reductions due to project activities. The study team instead recommends targeted monitoring of specific transport and logistics costs subsequent to the implementation of recommendations.

6.2 ENVIRONMENTAL CONSIDERATIONS

Recommendations regarding construction of market logistics infrastructures or other construction projects may cause both direct and indirect potential adverse environmental impacts. For example, soil compaction and erosion, sedimentation of streams and surface waters, contamination of water supplies, forest conversion, pollution, and loss of habitat and environmental services.

These considerations have been taken into account when formulating the recommendations in this report. It is not deemed that these recommendations will have significant environmental impacts as none involve construction of new infrastructure or significant alterations to existing infrastructure along the corridors.

ANNEX A: OBJECTIVES AND METHODOLOGY

OBJECTIVES

The rice Transport and Logistics Assessment will diagnose transportation and logistics related problems along the corridors, and propose recommendations to enhance the performance of the logistics chain. These recommendations will be validated by the stakeholders. The study will also recommend a package of best practices.

- Identify the primary inefficiencies in the rice transport and logistics system along corridors and across border posts, with vetting hypotheses coming from desk review and discussions with the value chain leaders and transport/policy advisors
- Analyze the relationship between inefficiencies, total transport and logistics costs, production costs, and prices in the end market;
- Identify public and private opportunities to improve procedures and technologies to address glaring inefficiencies in the rice transport and logistics process
- Recommend value-chain stakeholder strategies, based on study findings and global best practices, for implementing more efficient procedures and technologies
- Consult with stakeholders on study findings and recommendations to support their leadership role in implementing solutions

APPROACH AND METHODOLOGY

APPROACH

To achieve these objectives, the following tasks were identified:

- Conduct a **desk review** of available documentation on rice transport and logistics procedures and challenges in West Africa and share with all team members for their input[71]
- Meet with the E-ATP management team and the technical team both in Accra and Ouagadougou in the beginning of the field work and at the end of the field work
- Design a **survey instrument** and conduct a **survey** to estimate the cost of transporting rice along the Bobo-Segou-Bamako-Dakar corridor and to analyze the relationships

[71] See Annex B

among producers, processors, traders, transport operators, forwarding agents, customs and control agencies, and other market intermediaries active in the target corridors.[72]

- Conduct **field research** to administer questionnaires to producers, traders, agents and other stakeholders to collect data for rice transport and logistics costs. Also, to observe the state of road infrastructure, trucks, loading and off-loading materials, and markets

- **Analyze** data collected to determine actual costs and inefficiencies emerging from stakeholder interviews

- Produce a **final report** on all findings, including the following deliverables:

    - Transport cost assessments for millet/sorghum value chain along key corridors

    - Package of best practices in value chain logistics developed and recommended for rice value chain

METHODOLOGY

SECONDARY RESEARCH

The *Desk Review*[73] preceded field research and was performed in December 2010 and January 2011, principally by lead field researcher Laura Jane Busch, with comments and revisions provided by the CARANA and ATP teams. This review of the most relevant research and publications on the rice value chain transport and logistics in West Africa informed the research team working hypotheses, as well as served as background documentation for the development of the Transport and Logistics *Survey Instrument*.[74]

PRIMARY RESEARCH

The primary research was conducted in January and February 2011 by two teams, from E-ATP and the USAID Integrated Initiatives for Economic Growth in Mali (IICEM) project. The study's field research responsibilities were divided between these two projects, with the E-ATP team focusing on the corridors east of Bamako (to Bobo Dioulasso) and the IICEM team focusing on the corridors to the west of Bamako (to Dakar). Data and interview notes were subsequently shared to allow each project to focus on its own report deliverables.

- The E-ATP field research team comprised of Laura Jane Busch (lead field researcher) and Daouda Moussa (Study Coordinator and Field Research Assistant), with assistance from Bouraima Zoringré in Bobo Dioulasso and from Drissa Traoré in Southeast Mali.

  The team conducted 85 interviews during a 17 day field mission between January 27 and February 13 2011 in the following principle locations:

[72] See Annex C
[73] See Annex B
[74] See Annex C

- Ouagadougou, Burkina Faso
- Bobo Dioulasso, Burkina Faso
- Koloko/Heremakono: Burkina Faso/Mali border
- Sikasso, Mali
- Koutiala, Mali
- Koury/Faramana: Mali/Burkina Faso border
- Segou, Mali
- Niono, Mali
- Bamako, Mali

- The IICEM field research team comprised of Salihou Guiro (Task Manager and Lead Field Researcher) and 3 data collection assistants. The team conducted 47 interviews during a 8 day field mission between January 28 and February 5 2011 in the following principle locations:
  - Bamako, Mali
  - Kayes, Mali
  - Kaolack, Senegal
  - Dakar, Senegal

As far as possible the Survey Instrument[75] was used to guide questions during interviews, however, given the often informal nature of the value chain stakeholders it was frequently difficult to follow the prescriptive questions to the letter. Interviews were more often conducted as more informal discussions, loosely based on the Survey Instrument questions to solicit specific data points and facilitate an open conversation about challenges and constraints to increased intra-regional commerce.

DEFINITIONS AND ASSUMPTIONS

ARTICULATION OF RELEVANT COSTS

Each of the cost categories and cost line items identified will be divided into *Observed Cost, Extra Cost* and *Optimized Cost,* to the extent possible with the data available*:*

- ***Observed Cost*** – costs as observed in the field research, based on averages and most common responses from field interviews;

[75] See Annex C

- ***Extra Cost*** – a back-of-the-envelope estimation of the amount of the Observed Cost that is considered unnecessary, unjustified, or too expensive based on a variety of factors to be explained in each instance. For example, bribes, storage losses, and administrative charges without receipts or for which no service is rendered are considered extra costs. In some instances, extra costs are calculated based on market observations or reference to external sources. For example, Teravinthorn and Raballand (2008) provide benchmark estimates for per ton kilometer charges for transport costs. These benchmarks are used as a proxy for what a more competitive transport sector may be able to achieve in terms of lower prices.
- ***Optimized Cost*** – in this study, this is defined as the Observed Cost minus the Extra Cost.

COST CATEGORIES

Given the objective of quantifying transport and logistics costs along the rice value chain, it is important to clarify what is meant by transport and logistics costs, and what types of costs may or may not be included in this analysis. The following table lists the main categories of costs and example costs observed in the rice value chain studied

TABLE 1- CATEGORIES AND TYPES OF COSTS OBSERVED

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
ON FARM LOGISTICS All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to drying, shelling, cleaning, bagging, and on farm storage and handling costs	- On farm loading charges - On farm losses due to improper storage - On farm shelling services - On farm bagging services
MARKET LOGISTICS All formal and informal charges for non-transport services rendered throughout the logistics process.	- Loading and unloading charges (not including on farm loading) - Storage charges - Cost of bags - Re-bagging and sewing charges
TRANSPORT All formal and informal charges for transport services from farm to end market	- Transport fees/charges - Transport Agent Fee - Losses during transport
ADMINISTRATIVE CHARGES All formal and informal charges for trade facilitation services (customs, taxes, weigh stations, export documentation, and customs and forwarding agent fees)	- Customs fees - Weigh station fees - Conseil Malien des Transporteurs Routiers - Entrepots Malien au Senegal - Road tolls - Municipal taxes
INFORMAL PAYMENTS Explicit bribes paid	- Bribes paid at checkpoints - Bribes paid at borders

The categories capture the majority of the costs during the field research from the farm-gate to the market of final destination. When possible, copies of actual receipts were collected for

formal fees, and multiple sources were sought for all discussion of fees charged without corresponding services, informal fees or average bribes paid.

VARIETIES

Both white rice and parboiled rice are traded in the region. Although no difference was observed in transport and logistics costs between the two products, this report focuses on white rice, as it was the most commonly observed variety traded by the value chain actors interviewed.

CURRENCY

All prices and costs are shown in CFA Francs (FCFA). It was deemed pointless to translate these prices and costs in US dollars as all transactions observed along the corridors occurred in FCFA, as well as to avoid any distortions in data and subsequent analysis as a result of currency fluctuations.

PRICES AND COSTS

The source for all observed prices and costs shown in this report are directly from primary research conducted during this study, unless otherwise noted. As quoted prices often varied between interviewees, the research team endeavored to collect as many data points as possible. Values shown are based on an average of answers provided in interviews at each location, excluding obvious outliers and answers judged by the research team to be unreliable.

Prices and costs can vary significantly for rice throughout the year, and data was collected on seasonal high and low prices. Where a range was given, the annual average quoted price was used.

Where a percentage was given as a cost, for example percentage losses in storage, this percentage was multiplied by the final end market price to provide a value for this loss.

In the rare instance that a data point was unobtainable, for example losses during drying at a certain production location, an estimate based on values observed at similar locations was used as a proxy. Please see footnotes in these instances.

All costs and prices are presented on per kg basis to ensure comparability.

UNITS OF WEIGHT

Along the corridors studied the standard unit of weight is the kilogram, all actors were familiar with this unit of measurement and used it in their day to day transactions.

- In retail markets, especially those close to production zones, millet and sorghum is often sold by volume, based on a old tin (shown above, Bama Market), a “boite” or “tasse” of 2 or 3 kg depending on the market.

- Retailers in larger markets sell by the kilo using small scales (see below, Sikasso main market)

- Wholesale is conducted, in most cases observed, by 100kg or 50kg sack (See right, Niono)

ANNEX B: DESK REVIEW

This literature review provides an overview of the main transport and logistics constraints to trade in rice in West Africa.

OVERVIEW

From an international trade perspective, rice continues to be one of the most protected commodities in both developing and developed countries, through high tariff and non-tariff barriers, export restrictions and aid, state trading and other domestic market interventions. Most Western nations heavily subsidize their rice producers, and in doing so depress world rice prices.[76]

Since the 1960s rice has become West Africa's most popular food staple, comprising an average of 12% of daily calories (see table). However, the region relies heavily on extra-regional imports (West Africa buys approximately 20 percent of the world's rice exports) and is as such extremely vulnerable to external price shocks, which have in recent years been a pervasive food security issue, with the poorest populations the most vulnerable.

RELATIVE CONSUMPTION OF STAPLE FOODS IN WEST AFRICA - SOURCE: FAO FOOD BALANCE SHEETS

Item	Quantity Consumed (kg/capita/yr)	Daily Intake of Calories (kcal/capita/day)	Share of Calories (%)
Wheat	19.1	142	5%
Rice (Milled Equivalent)	32.8	324	12%
Maize	26.1	225	8%
Millet	36.4	283	11%
Sorghum	33.1	263	10%
Cassava	97.6	245	9%
Yams	70.5	193	7%
Pulses, Other	9.7	90	3%
Palm Oil	4.7	113	4%
Fruits	57.5	93	4%
Livestock	9.4	45	2%
Fish, Seafood	11.4	21	1%

The ATP Rice Value Chain analysis provides a thorough overview of the importance of expanding and facilitating rice trade in West Africa:

[76] Rice Value chain study: ATP

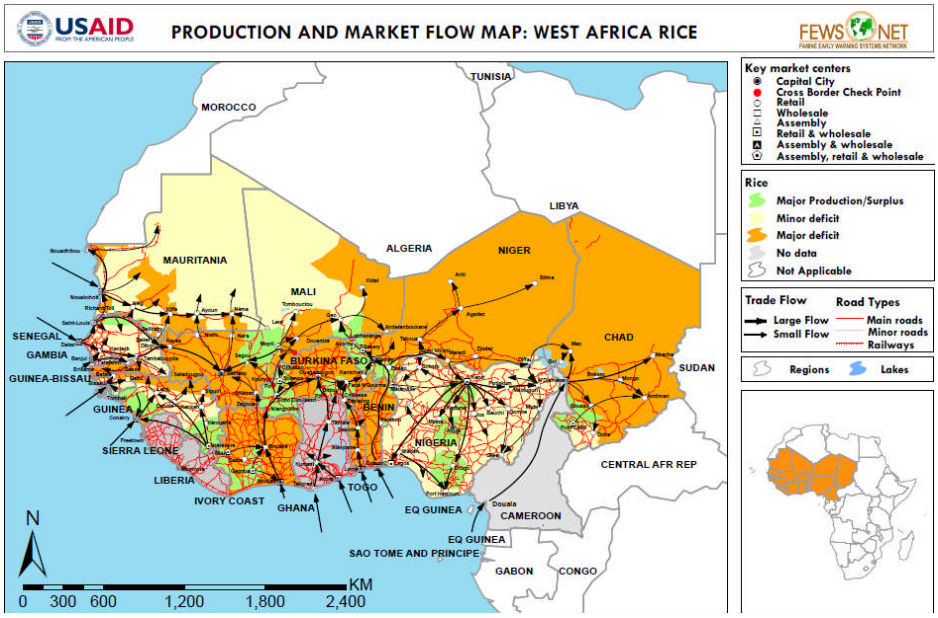
In most of West Africa, rice production has not been able to meet the increases in demand triggered by population growth, rapid urbanization, increasing incomes and urban consumers' preferences in terms of cost and ease of cooking. As a result, the region relies on imports to supply half of its demand for rice. In the spring of 2008, world prices for rice tripled in less than four months and reached a 30-year, inflation-adjusted high. [….] Since their peak in May 2008, rice prices have receded, but remain high by historical standards due to continued ex-port restrictions by Egypt and India as well as Thailand's rice mortgage scheme and huge government stocks. The price decline since May 2008 reflects large harvests in Asia, retreats in oil prices and dampening consumer demand associated with the world recession. Nevertheless, in the longer run, prices are likely to remain high and shortages and price spikes could recur

With regional rice imports totaling more than 6 million metric tons (MT) per year [….] A food-security strategy for rice in West Africa needs to satisfy multiple aspects of food security. It must foster the supply of rice to meet the demands of urban and peri-urban populations that currently consume large quantities of imports (in most countries). At the same time, it must address food access by rural populations, many of whom cultivate rice for subsistence. Improved productivity of rain-fed rice could contribute substantially to the food security of the most rural and poor populations. In addition, trade is essential to the efficient distribution of food to deficit areas from surplus areas that have a competitive advantage for growing large volumes of rice. A food-security strategy for rice in West Africa therefore has three distinct but complementary components that will need to be balanced in a re-source-constrained environment.

Therefore, intra-regional trade represents an important safeguard to food security by mitigating price shocks. In addition, trade expansion represents a significant economic opportunity for regional producers to expand their market shares and increase their incomes.

The following map shows the main production and deficit zones between which trade occurs in West Africa. Trade also occurs within production zones owing to seasonal local deficits and surpluses.

MAJOR RICE FLOWS IN WEST AFRICA. SOURCE: FEWSNET



TRANSPORT AND LOGISTICS CONSTRAINTS

There are great potential benefits of expanding regional trade; to producers and consumers, as well as the improvement of food security in the region. However, significant constraints exist, especially relating to transport and logistics which severely limit the extent to which goods can reach their destination markets in a timely, cost effective manner while maintaining quality standards.

Transport and logistics issues along the identified corridors are pervasive, characterized by high costs, long transit times, uncertainty, and corruption.[77] In their 2008 study of transport costs in Africa for the World Bank, Teravanithorn and Rallaband estimated that transport prices for most African landlocked countries range from 15 to 20 % of import costs, three to four times more than most developed countries[78]. More specifically, a study conducted by the West Africa Trade Hub found that transport costs along the Tema-Ouagadougou corridor are up to 7 times higher (despite labor costs being 25 times lower), can take over 4 times longer and involve much more uncertainty than along a transport corridor of comparable distance (Newark-Chicago) in the USA.[79]

Several studies have highlighted the specific transport and logistics issues affecting cereal trade in West Africa. These issues include:

- poor road conditions;

[77] West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010
[78] Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009
[79] West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010

- inadequacies in storage, handling, equipment and vehicles;
- lack of standardization of weights, measure and quality grading
- underdeveloped logistics and trucking services; and
- road harassment and delays at border checkpoints.

These issues are discussed in further detail below.

Road infrastructure:

Poor road infrastructure leads to higher vehicle operating costs per kilometer, which are in turn passed onto freight customers through higher road usage costs. In addition, poor roads lengthen travel times which add to time delays and the increased risk of spoilage and damage to the crop, resulting in loss of revenue at the destination market.[80] Many studies highlight capital investment to improve physical road infrastructure as a key recommendation for reducing transport and logistics costs for coarse grains, as well as for other agricultural commodities. In fact, a USAID study on Mali's trade and development states that Mali's undeveloped infrastructure is a major reason for its lack of competitiveness in global markets.[81]

Further research on the extent to which poor road infrastructure affects transport costs for rice relative to other factors would be useful in terms of gaining insight into the scope and scale of required capital investment, and which infrastructure policy improvements could be prioritized and implemented.

Storage infrastructure and handling processes:

Inadequate storage facilities and handling procedures are another major cost driver, allowing for the degradation and spoilage of the commodity, and severely decreasing the competitiveness of the product. According to the ATP Millet and Sorghum Value chain assessment, in West Africa, the poor storage infrastructure necessary for the preservation of millet/sorghum along the corridor contributes to high marketing costs and greatly impedes the flow of goods.[82] Furthermore, according to the USAID Maize Value Chain Assessment report, approximately 30% of maize is lost post harvest, mostly at the farmer level, and the majority of farmers sell soon after harvest, when prices are lowest (unable to time the market), due to a lack of on-farm storage and cash flow needs.

Storage systems are mostly traditional and with limited aeration in the hot and humid climate. In addition, farmers often do not follow technical recommendations for fumigation, and as a result weevils and fungi account for most of the losses. Furthermore, underdeveloped warehousing

[80] The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003
[81] USAID Mali Trade Development Program, 2002
[82] Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

facilities along the value chain[83] coupled with delays in transit times contribute further to spoilage problems.

In transit, the sacks used for the cereals are often old and worn resulting in a high degree of spillage, especially at transfer points.[84] The loading and unloading of the sacks at truck transfer points is operated informally and is often a slow, inefficient and poor service. Arrivals and departures at transfer points are typically unscheduled which can lead to delays and inefficiencies in transfers, in addition lack of service standards results in poor/rough handling which causes degradation of the sacks and spillage.

Further research into the costs and causes of inadequate storage and handling of rice along the value chain is necessary to inform the interventions needed to remove these logistics barriers to trade, reduce losses and improve efficiency.

Standard measures and grading

A lack of standardized process/system and little access to equipment for weighing and grading the crops is another impediment to regional trade, as this promotes a lack of harmonization of standard weights and measurements and quality norms.[85]

Evidence from the forthcoming ATP maize transport and logistics cost study shows that, particularly as the primary production and collection stage of the value chain, standard weight and measures are not often used, resulting in low transparency in transactions and reduced efficiency.

Furthermore, unprocessed grains will often contain a relatively high percentage of impurities. For example, anecdotal evidence shows that cereals trades in Mali have up to 18% impurity. Quality control is largely ad-hoc, and often results in multiple re-baggings at each market for the purchaser to observe the quality of the cereal he is purchasing.

Introducing a standard system of measurement, and accompanying market infrastructure (weigh stations) as well as a differential pricing based on a standardized grading system for crop quality may have a positive impact. Consumers could discern the quality of the crop they are buying (this could be especially important for processors), and producers would have the incentive to make investments to improve efficiency and quality standards in order to obtain a higher price for their crop.

A paper by CIRAD notes that poor rice production processes in West Africa do not allow domestic product to match the quality of imported rice in terms of homogeneity and cleanliness. Consumers are ready to pay for a higher price for imported clean and well packed rice[86]. Improved quality of rice in the region could represent a significant income and production growth opportunity, and more research in this area is important. Furthermore, more research into the

[83] The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003
[84] Maize Value Chain Assessment ATP Draft Technical Report No.1, September 2008
[85] Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010
[86] CIRAD Rice imports in West Africa

effects of the lack of standardized weights/measure and their interaction with producer and consumer prices along the value chain would inform potential interventions in this equipment and process along the corridor.

Lack of formalization

Cereals value chains in West Africa suffer from widespread organizational deficiencies: lack of cooperation among actors, a tendency to operate independently, lack of strong farmer groups, trade associations and top-down professional bodies. These organizational deficiencies increase the cost of doing business, discourage investment and otherwise hamper the potential for greater horizontal and vertical integration which could be an engine for growth[87]. As a result, the development of long-distance and more formalized trade is inhibited, perpetuating a tradition of informal cash transactions with no documentation and few contracts, along with difficulties in obtaining credit

Trucking Services:

ECOWAS protocols state that vehicles must comply with certain standards with the aim of reducing road damage, accidents and the use of substandard vehicles. There are regulations on transport permits, vehicle dimensions and loads as well as haulage practices. However, a recent study by the West Africa Trade Hub (Ghana Gap analysis) indicates that these protocols are often not being well implemented in practice.[88]

Overloading of trucks is a highly visible characteristic road transport in West Africa. In addition to causing damage to commodities in transit, overloading leads to road infrastructure degradation which in turn has an effect on efficiency of truck operations (as mentioned above): delays, spoilage, damage to vehicles and higher transport costs. Axle load legislation has gone some way to reducing overloading problems, however, a review of the World Bank Teravaninthorn & Raballand study by the West Africa Trade Hub shows that transport prices have increased significantly (more than 70% in some cases) since the introduction of the legislation, now that trucking operatives cannot overload their vehicles to reduce costs.[89] In addition, given the stricter legislation, truckers may offer higher bribes to officials to let their overloaded trucks pass the weight inspections, leading to further increased costs passed on in the price charged to service users.

The USAID study on Onion Transport and Logistics along the Madaoua-Accra corridor notes that because agricultural traders are less likely to utilize formal trucking operators to transport their products, they are more likely to be using illegal, unlicensed, overloaded and poorly maintained trucks which drive up costs in terms of delays, spoilage, and higher bribes paid.[90]

[87] ATP Analysis of Millet/Sorghum Value Chain in West Africa
[88] Gap Analysis, ECOWAS Free Trade Area. Ghana, West Africa Trade Hub 2010
[89] Appraisal of World Bank's Report on Road Transport prices and costs in Africa, Case of West Africa, West Africa Trade Hub, 2009
[90] Onion Transport and Logistics Study along the Madaoua-Accra Corridor, ATP West Africa, 2010

A study by the West Africa Trade Hub on T&L in the cashew value chain notes that a key cost driver is fragmentation in the trucking market between farm and processor.[91] In that there are a lot of small, independent trucking operators, coupled with poor market information for those wishing to procure trucking services, so it is difficult for those wishing to procure trucking services to find good quality operators, compare stable prices, and establish formalized contracting and service provision.

Further research into the vehicle related costs along the value chains, and the interaction between vehicle standards, informality, service procurement and contracting, overloading, road damage, breakdowns, inefficiencies, delays, spoilage, bribes, and costs could help to inform target interventions such as training, change in policy or change in the application of existing policy.

Trucking market:

According to the Bamako-Dakar corridor cost analysis (which studied the rice and cotton value chains), eighty percent of all Mali-bound traffic from Dakar, moves along the corridor by road. Since the trucking industry in Senegal is dominated by a large number of very small operators, who own and operate an obsolete trucking fleet, most of the traffic (≈90%) to Mali is carried on Malian trucks. Rail used to play a much more important role in transport along the corridor. However, management missteps and lack of investment have greatly deteriorated rail infrastructure, reducing its capacity and reliability, and thus its share of Malian traffic.

The trucking market in West Africa is characterized by local private entrepreneurs and private fleet operators (many of which operate under contracts for other transport intermediaries or carriers) provide road transport. This can result in a highly fragmented market and a wide variation in pricing by locality and by country, with operating costs, vehicle utilization and load factors all having a role in determining local inland cost.[92]

According to the World Bank study, the trucking industry has low levels of productivity, low levels of competition between fleet operators, and high rates of collusion (cartels) which significantly drive up the prices and reduces quality of service. The study finds that profit markups of trucking companies are excessively high.[93] There is an oversupply of trucks at the vehicle level due to low capacity utilization rates, and low incentives to maintain fleet quality leading to inadequate maintenance, frequent breakdowns, and inefficient service.

Several studies, including the West Africa Trade Hub report on transport and logistics along the Tema-Ouaga corridor note that structural imbalances in the freight market lead to difficulties in finding a loading for the return trip from the transport destination.[94] This structural imbalance leads to lower fleet efficiency and capacity utilization and higher costs to the fleet customers.

[91] Transport and Logistics in the Cashew Value Chain, West Africa Trade Hub 2009
[92] The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003
[93] Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009
[94] West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010

Further research into the trucking market in relation to intra-regional transport barriers to trade would complement existing studies and highlight areas in which inefficiencies could be addressed.

Customs, harassment and informal costs:

Delays and informal costs at the border and at checkpoints are a major driver of road transport costs, according to several studies including the TESS study on transport and logistics. Besides slowing down the movement of goods from source to markets, these activities represent illicit taxes that raise the cost of doing business and impact ultimately on the overall volume of trade.

Many studies, including the aforementioned study on trade in Mali, have highlighted that harassment of traders and transporters by police and local authorities is a pervasive issue in West Africa. Further, the Dakar-Bamako corridor cost analysis notes that the corridor is presently regarded as one of the worst in the region, particularly in terms of the number of control posts, delays, and police harassment related to arbitrary inspections and demands for bribes.[95]

Illegitimate rent seeking and harassment along transport corridors represents a serious and highly visible constraint to trade in the region. Most informal payments are paid either by forwarders and truckers and are included in the price they quote to traders, or by the traders themselves who may ride along with the truckers. As maize is a common commodity, bribes are often taken in kind, i.e. an amount of maize will be extorted in place of a monetary bribe.

For instance, the West Africa Trade Hub study on transport and logistics along the Tema-Ouagadougou corridor found that bribes paid at road barriers represent up to 8.2% of transport costs, and notes that informal costs are a much bigger problem than just the costs of the bribes themselves because of the delays and uncertainty they generate[96]. The report on Mali trade notes that official taxes account for 22 percent of total transport costs, and illicit taxes add another seven to ten percent[97]. Furthermore the World Bank study finds that bribes (paid to "middlemen" at formal and informal checkpoints) constitute up to 10% of variable costs to transporters.[98] According to the West Africa Trade Hub Tema-Ouaga report, customs agents collect the highest portion of the bribes.

It is known that truckers and traders transporting agricultural products pay even more in bribes than those transporting other commodities. This is because bribes paid to avoid delays at checkpoints are more likely as the potential for payload spoilage means that transit is more urgent. Secondly, as mentioned above, agricultural traders are less likely to utilize formal trucking operators to transport their products, so they are more likely to be using illegal, unlicensed, overloaded and poorly maintained trucks which means that higher bribes will be paid to pass without impediment through checkpoint inspections.

[95] Dakar-Bamako corridor costs analysis
[96] West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010
[97] USAID Mali Trade Development Program, 2002
[98] Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009

Road barriers, blocks and control points also represent a significant cost driver in terms of delays, according to the West Africa Trade Hub report. On the road between Tema and Ouagadougou, truckers will be stopped at about 36 points, where they will be delayed by an average of 4 hours, representing up to 6% of the total time spent on the corridor.[99] For agricultural commodities, delays are a particularly important issue as they have a limited shelf life (although for grains it is longer than other agricultural products), and can easily spoil particularly because it is very susceptible to exposure to moisture and pests while in transit. Furthermore, traders are also often under pressure to deliver on time to buyers with whom they have agreements, lest risk dissolution of their valuable business partnerships.

To reduce costs and delays at customs point and border crossings, several studies including the TESS report and the West Africa Trade Hub Tema-Ouaga report, recommend reducing corruption, simplification of procedures (for example, document harmonization), training, and computer automation as well as implementing bilateral and regional transit corridor rights.[100] Further research into road harassment in terms of its causes and effects on the value chains will inform more specific interventions.

Overall

Expansion in intra-regional trade in rice is an important opportunity for economic growth in West Africa and reduction in the risk of price shocks and food security problems. Transport and logistics issues along the transit corridors in question represent significant barriers to this trade expansion. A review of existing literature has highlighted known problems, and demonstrates that further research and study of these issues in relation to the rice value chain will be necessary to undertake targeted interventions to reduce inefficiency and costs, and improve quality and volume traded.

[99] West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010
[100] The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003

ANNEX C: SURVEY INSTRUMENT

Guide d’Enquête sur les coûts de Transport et de Logistique des Céréales

E-ATP

IICEM

Riz, Mil & Sorgho, Mais

Notez que ce guide d'enquête n'est pas un questionnaire écrit, mais seulement un guide pour l'intervieweur

Cette enquête est menée par le projet Initiatives Intégrées pour la Croissance Economique au Mali (IICEM) et le projet Extended Agribusiness and Trade Promotion (E-ATP), financés par l'USAID. Le but de l'enquête est d'évaluer les coûts de manutention post-récolte et de transport liés au déplacement des céréales des zones de production aux marchés de consommation. En identifiant les pratiques actuelles de manutention et de transport, les projets cherchent à déterminer les moyens de réduire les coûts exorbitants de transport et de logistique, et d'accroître ainsi la valeur marchande du produit aux producteurs tout en réduisant les coûts pour les consommateurs.

Merci

Les Producteurs

Mil/sorgho Mais Riz (Encercler)

Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!

Lieu et Corridor
Nom de famille
Prénom
Homme/Femme
Date
Contact email/numéro de téléphone

Prix et Volume

a) Prix de vente de vos céréales juste après la récolte-produit abondant sur le marché (Précisez l'unité)
b) Prix de vente de vos céréales pendant les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
c) Pourcentage de votre production de céréales vendue% / stockés%
d) Quel est le volume de céréales que vous avez vendu depuis Juillet 2010?

Transport au Lieu de Vente

e) Moyen de transport de vos céréales au lieu de vente
f) Distance du champ au lieu de vente (km)
g) Durée en heures du trajet du champ au lieu de vente
a) Combien de sacs par /camion /camionnette /charrette?
b) Combien de kilos par sac?

h) Frais de transport de vos céréales du champ au lieu de vente (Précisez l'unité)
i) Structure des coûts de transport des céréales:
   i. Coût de l'ensachage (Précisez l'unité)
   ii. Coût de chargement (Précisez l'unité)
   iii. Coût du transport (Précisez l'unité)
   iv. Coût de déchargement (Précisez l'unité)

j) Quel moyen de transport utilisez –vous pour le transport de vos céréales au lieu de vente?
   i. Utilise mon propre /camion /camionnette /charrette
   ii. Vend les céréales sur le lieu de production aux commerçants qui ont leurs propres véhicules
   iii. Paie un agent pour trouver un moyen de transport (prix ?)
   iv. Demande des propositions de prix de transport à différentes sociétés
   v. Fais transporter par un partenaire privilégié

<u>Le Stockage</u>

k) Coût de stockage (Précisez l'unité)
l) Méthodes de séchage, égrenage, classification, et stockage:
   i. Traditionnelle au champ (préciser le type de stockage, séchage, classification, et les matériels utilisés)
   ii. Utilisation de méthodes modernes (préciser le type de stockage, séchage, classification, et les matériels utilisés)
   iii. Décrivez, s'il vous plait, l'entretien de ces infrastructures (individuelles ou collectives) en termes de ventilation, nettoyage entre les récoltes, stockage des pesticides ou d'autres produits toxiques, la protection contre les insectes

<u>Pertes et Impuretés</u>

m) Pertes de céréales en pourcentage:
   i. Juste après la récolte %
   ii. Pendant le séchage %
   iii. Pendant le battage ou l'égrenage %
   iv. Pendant le stockage %
   v. Pendant le transport %

n) Quelles sont les causes les plus importantes de vos pertes post récolte de céréales?

3	2	1
Cause de perte très importante	Cause de perte plus ou moins importante	Cause de perte peu importante

   i. Humidité
   ii. Maladie
   iii. Insectes
   iv. Rongeurs/autres animaux
   v. Mauvais état des sacs
   vi. Mauvaise manipulation (décrivez)
   vii. Moyen de battage (décrivez le moyen)
   viii. Manque d'équipement pour le pesage et la classification
   ix. Le vol
   x. Autre (Précisez

o) Quel pourcentage d'impuretés est trouvé dans vos céréales_____
p) Quelles sont les sources les plus importantes des impuretés dans vos céréales?

3	2	1
source d'impureté très importante	source d'impureté plus ou moins importante	source d'impureté peu importante

   i. Humidité

ii. Maladie
iii. Insectes
iv. Rongeurs
v. Sacs
vi. Mauvaise manipulation (décrivez)
vii. Moyen de battage ,d'égrenage, de séchage (décrivez le moyen)
viii. Autres (préciser)

q) Votre production est-elle soumise à des inspections de qualité? Expliquer
r) Est-ce qu'il y a des différences de prix entre les céréales de bonne/mauvaise qualité ou variété?

Merci

Cette enquête est menée par le projet Initiatives Intégrées pour la Croissance Economique au Mali (IICEM) et le projet Extended Agribusiness and Trade Promotion (E-ATP), financés par l'USAID. Le but de l'enquête est d'évaluer les coûts de manutention post-récolte et de transport liés au déplacement des céréales des zones de production aux marchés de consommation. En identifiant les pratiques actuelles de manutention et de transport, les projets cherchent à déterminer les moyens de réduire les coûts exorbitants de transport et de logistique, et d'accroître ainsi la valeur marchande du produit aux producteurs tout en réduisant les coûts pour les consommateurs.

Merci

Commerçant / Collecteur de Céréales (Encercler)

Mil/sorgho Mais Riz (Encercler)

Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!

Lieu et Corridor
Nom de famille
Prénom
Homme/Femme
Date
Contact email/numéro de téléphone

Prix et Volume

s) Prix de vente de vos céréales juste après la récolte-produit abondant sur le marché (Précisez l'unité)
c) Prix d'achat de vos céréales pendant les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
d) Quantité de céréales que vous avez achetée depuis Juillet 2010

Le Transport

e) Lieu d'achat
f) Ville de destination
g) Distance du lieu d'achat au lieu de vente (km)
h) Durée en heures du trajet du champ au lieu de vente
i) Moyen de transport
j) Combien de sacs par /camion /camionnette /charrette?
k) Combien de kilos par sac?
l) Distance du lieu d'achat au lieu de vente (km)Durée en heures du trajet du champ au lieu de vente

m) Comment transportez-vous les céréales du lieu d'achat au lieu de vente?
ix. Utilise mon propre /camion /camionnette /charrette
x. Les agriculteurs me livrent les céréales à mon magasin de stockage

xi. Paie un agent pour trouver des camions (Prix ?)
xii. Demande des propositions de prix transport à différentes sociétés
xiii. Fais transporter par un partenaire privilégié

t) Frais de transport de vos céréales du lieu d'achat au lieu de vente (Précisez l'unité)

u) Structure des coûts de transport des céréales:
xiv. Coût de l'ensachage (Précisez l'unité)
xv. Coût de chargement du /camion /camionnette /charrette (Précisez l'unité)
xvi. Coût des services de fret (Précisez l'unité)
xvii. Coût du déchargement de camions (Précisez l'unité)

Temps requis pour le chargement (minutes)

n) Temps nécessaire pour le déchargement (minutes)

Documentation et Retards

v) Documentation administratifs (SVP expliquer chaque document et le coût)
w) Retards sur la route (indiquer si les paiements sont faits par le transporteur ou le commerçant)
   a) Nombre de péages routiers
   b) Temps d'attente a chaque péage (minutes)
   c) Nombre de points de contrôle
   d) Délai moyen d'attente aux points de contrôle (minutes)
   e) Délai moyen de traversée de la frontière (minutes)
   f) Inspections Phytosanitaires
   g) Nombre de pannes de camion
   h) Heures de retard pour pannes de camion
   i) Autre retard (Précisez SVP)

Frais administratifs

o) Frais administratifs (SVP précisez s'ils sont payés par le commerçant ou par le transporteur)
   i. Frais officiels (Précisez l'unité)
   ii. Frais non officiels (Précisez l'unité)
   iii. Frais perçus par le syndicat des transporteurs(Précisez l'unité)
   iv. Frais sanitaires/phytosanitaires (Précisez l'unité)
   v. Autres frais administratifs (Précisez l'unité)

Le Stockage

p) Coût de stockage _____ (Précisez l'unité)

q) Méthode de stockage: (préciser le type de stockage, les matériels utilisés)
xviii. Equipement de stockage moderne ?

xix. Equipement de stockage traditionnel ?
xx. l'entretien de ces infrastructures (individuelles ou collectives) en termes de ventilation, nettoyage entre les récoltes, stockage des pesticides ou d'autres produits toxiques, la protection contre les insectes

Pertes et impuretés

r) Pertes de céréales en pourcentage :
xxi. Pendant le transport %
xxii. Pendant le stockage %

s) Quelles sont les causes les plus importantes de vos pertes de céréales après l'achat/collecte?

3	2	1
Cause de perte très importante	Cause de perte plus ou moins importante	Cause de perte peu importante

i. Humidité
ii. Maladie
iii. Insectes
iv. Rongeurs
v. Mauvais état des Sacs
vi. Mauvaise manipulation
vii. Autre (précisez)

t) Pertes physiques (%)
i. dues aux pannes de camion %
ii. dues aux pertes de temps aux postes de contrôle et aux frontières %
iii. dues à la surcharge %
iv. dues à la manipulation et aux trous dans les sacs %
v. Pertes attribuables à des parasites et des maladies %
vi. Autre (précisez) %

u) Quel pourcentage d'impuretés est trouvé dans vos céréales ?

v) Quelles sont les sources les plus importantes des impuretés après achat/collecte de vos céréales?

3	2	1
source d'impureté très importante	source d'impureté plus ou moins importante	source d'impureté peu importante

xxiii. Humidité
xxiv. Maladie
xxv. Insectes
xxvi. Rongeurs
xxvii. Mauvais état des sacs
xxviii. Mauvaise manipulation
xxix. Mode de battage

xxx. Autre (précisez)

w) Est-ce qu'il ya des inspections de qualité? Expliquez
x) Est-ce qu'il y a des différences de prix entre les céréales de bonne/mauvaise qualité?

y) Les projets potentiels. Lequel des projets suivants serait le plus bénéfique pour la chaîne de valeur de cette céréale en termes relatifs:

3	2	1
Extrêmement Bénéfique	Assez Bénéfique	Pas bénéfique

i. Réduction du nombre de points de contrôle le long de la route
ii. Stations de classification
iii. Stations de pesage
iv. Centre de chargement et de déchargement pour camions
v. Bourse de transport ou centre d'information sur le transport
vi. Formation sur la bonne manipulation et ensachage des grains
vii. Plus grande disponibilité d'offres de transport aux coûts compétitifs
viii. Amélioration de la qualité des céréales
ix. Autre (décrivez SVP)

Merci

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Merci

Transporteurs

Mil/sorgho Mais Riz (Encercler)

Précisez l'unité de mesure: tasse, sac, kilo, tonne !!!

Lieu et Corridor
Nom de famille
Prénom
Homme/Femme
Date
Contact email/numéro de téléphone

Prix et Volume

j) A quel prix transportez-vous les céréales ?
x. A la tonne-kilomètre (TKM)
xi. Forfait par kilomètre
xii. Forfait par kilogramme

k) Nombre de voyages par mois depuis Juillet 2010
l) Nombre de voyages avec retour à vide des camions depuis Juillet 2010
m) Itinéraire suivi pour le transport de céréales du lieu de chargement à la ville de destination
n) Comment trouvez-vous les clients ? (Utilisez-vous un agent ?)
o) Signez-vous des contrats formels avec les clients ?

Véhicule

p) Type de camion
q) Est-ce que vous avez votre propre camion, ou travaillez-vous pour une entreprise qui possède le camion
r) Connaissez-vous les règles et les règlements sur pour le fonctionnement de votre véhicule et le transport de marchandises?
s) Charge utile du camion
t) Pays d'immatriculation du véhicule

u) Age du véhicule
v) Frais d'exploitation :

Quels sont les frais d'exploitation les plus importants de votre véhicule ?

3	2	1
Extrêmement important	Assez important	Pas important

xiii. L'amortissement
xiv. Le carburant
xv. L'assurance
xvi. L'entretien courant
xvii. Les réparations
xviii. Les pneus
xix. Les impôts et taxes
xx. Les frais administratifs
xxi. Autres (Expliquez)

w) Estimez les frais d'exploitation par kilomètre

<u>Chargement/Déchargement</u>

x) Temps d'attente de l'arrivée du camion à son chargement (minutes)
y) Durée de chargement du camion (minutes)
z) Temps passé entre l'arrivée et le déchargement du camion dans la ville de destination
aa) Temps consacré à décharger le camion dans la ville de destination

<u>Retards sur la route</u> (indiquer si les paiements sont faits le transporteur ou le commerçant)

bb) Nombre de péages routiers
cc) Temps d'attente a chaque péage (minutes)
dd) Nombre de points de contrôle
ee) Délai moyen d'attente aux points de contrôle (minutes)
ff) Délai moyen de traversée de la frontière (minutes)
gg) Inspections Phytosanitaires
hh) Nombre de pannes de camion
ii) Heures de retard pour pannes de camion
jj) Autre retard (Précisez SVP)

<u>Frais Administratifs</u>

kk) Frais administratifs (SVP précisez s'ils sont payés par le commerçant ou par le transporteur)
xxii. Frais officiels (Précisez l'unité)
xxiii. Frais non officiels (Précisez l'unité)
xxiv. Frais perçus par le syndicat des transporteurs (Précisez l'unité)
xxv. Frais sanitaires/phytosanitaires (Précisez l'unité)
xxvi. Coûts des permis et licences (Précisez l'unité)

ll) Les projets potentiels. Lequel des projets suivants serait le plus bénéfique pour

l'industrie de transport des céréales en termes relatifs :

3	2	1
Extrêmement Bénéfique	Assez Bénéfique	Pas bénéfique

xxvii. Réduction du nombre de points de contrôle le long de la route
xxviii. Stations de classification
xxix. Stations de pesage
xxx. Centre de chargement et de déchargement pour camions
xxxi. Bourse de transport ou centre d'information sur le transport
xxxii. Formation sur la bonne manipulation et l'ensachage des grains
xxxiii. Formation sur la maintenance des camions
xxxiv. Formation sur la gestion des camions
xxxv. Autre (SVP décrivez)

Merci

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Merci

Marché de Vente

Lieu
Contacts de la Gestion

Observations de l'enquêteur dans le marché

a) Nombre de camions présents

b) Temps de chargement/déchargement (minutes)

c) Observations sur les équipements/infrastructures
    a) Stations de classification (de qualité)
    b) Stations de pesage
    c) Centre de chargement et de déchargement pour camions
    d) Centre pour la négociation commerciale
    e) Station d'inspection SPS
    f) Centre pour le (ré) ensachage
    g) Infrastructures de stockage
    h) Autres observations

d) Observations sur la gestion du marché

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Merci

le Grossiste

Précisez l'unité de mesure: tasse, sac, kilo, tonne !!!

Lieu et Corridor
Nom de famille
Prénom
Homme/Femme
Date
Contact email/numéro de téléphone

Prix et Volume

a) Prix d'achat de vos céréales après la récolte-produit abondant sur le marché (Précisez l'unité)
b) Prix de vente de vos céréales pendant les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
c) Quel est le volume de céréales que avez-vous acheté depuis Juillet 2010
d) Combien de jours a-t-il fallu pour vendre les céréales dans le marché?

Transport

e) D'où proviennent les céréales?
f) Temps en minute requis pour que le camion soit déchargé
g) Durée du trajet de la ville d'origine de vos céréales au marché
h) Frais de transport ?

Pertes et impuretés

i) Avez-vous des exigences pour les céréales que vous achetez? (e.g. la qualité, etc)
j) Combien plus cher paieriez-vous une meilleure qualité ?

k) Pertes de céréales en pourcentage :
   i. Pendant le transport %
   ii. Pourcentage des pertes pendant le déchargement%
   iii. Pendant le stockage %
   iv. Pourcentage des pertes pendant la vente%

l) Quelles sont les causes les plus importantes de vos pertes après achat de vos céréales?

3	2	1
Cause de perte très importante	Cause de perte plus ou moins importante	Cause de perte peu importante

xxxi. Humidité
xxxii. Maladie
xxxiii. Insectes
xxxiv. Rongeurs
xxxv. Sacs
xxxvi. Mauvaise manipulation
xxxvii. Autre (précisez)

m) Pourcentage d'impuretés dans les céréales ?

n) Quelles sont les sourcesles plus importantes des impuretés dans vos céréales après vos achats?

3	2	1
source d'impureté très importante	source d'impureté plus ou moins importante	source d'impureté peu importante

xxxviii. Humidité
xxxix. Maladie
xl. Insectes
xli. Rongeurs
xlii. Sacs
xliii. Mauvaise manipulation
xliv. Autre (précisez)

o) Pourcentage raisonnable des pertes et impuretés pour vous ?

<u>Stockage</u>

p) Coût de stockage (Précisez l'unité)
q) Méthode de stockage: (précisez le type de stockage, les matériels utilisés)
i. Equipement de stockage moderne
ii. Equipement de stockage traditionnel
xlv. l'entretien de ces infrastructures (individuelles ou collectives) en termes de ventilation, nettoyage entre les récoltes, stockage des pesticides ou d'autres produits toxiques, la protection contre les insectes

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Merci

le Détaillant

Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!

Lieu et Corridor
Nom de famille
Prénom
Homme/Femme
Date
Contact email/numéro de téléphone

r) Quantité de céréales achetée chaque mois depuis Juillet 2010?
s) Pourcentage des pertes pendant les ventes
t) Combien de jours a-t-il fallu pour vendre les céréales dans le marché?
u) Prix d'achat moyen des céréales après la récolte-produit abondant sur le marché (Précisez l'unité)
v) Prix de vente moyen des céréales les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
w) Fréquence d'achat (quotidienne, hebdomadaire, bihebdomadaire ou mensuelle)
x) Quels sont les exigences que vous avez pour les céréales que vous achetez ? (e.g. la qualité, etc.)
y) Pourcentage d'impuretés dans les céréales?
z) Pourcentage raisonnable d'impureté pour vous?
aa) Combien plus cher paieriez-vous une meilleure qualité ?

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Merci

le transformateur/un autre acheteur

Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!

Lieu et Corridor
Nom de famille
Prénom
Homme/Femme
Date
Contact email/numéro de téléphone

a) Quantité de céréales achetée chaque mois depuis Juillet 2010?
b) Prix d'achat moyen des céréales après la récolte-produit abondant sur le marché (Précisez l'unité)
c) Prix de vente moyen des céréales les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
d) Fréquence d'achat (quotidienne, hebdomadaire, bihebdomadaire ou mensuelle)
e) Quels sont les exigences que vous avez pour les céréales que vous achetez? (e.g. la qualité, etc.)
f) Pourcentage d'impuretés dans les céréales?
g) Pourcentage raisonnabled'impureté pour vous?
h) Combien plus cher paieriez-vous une meilleure qualité?

Merci Beaucoup